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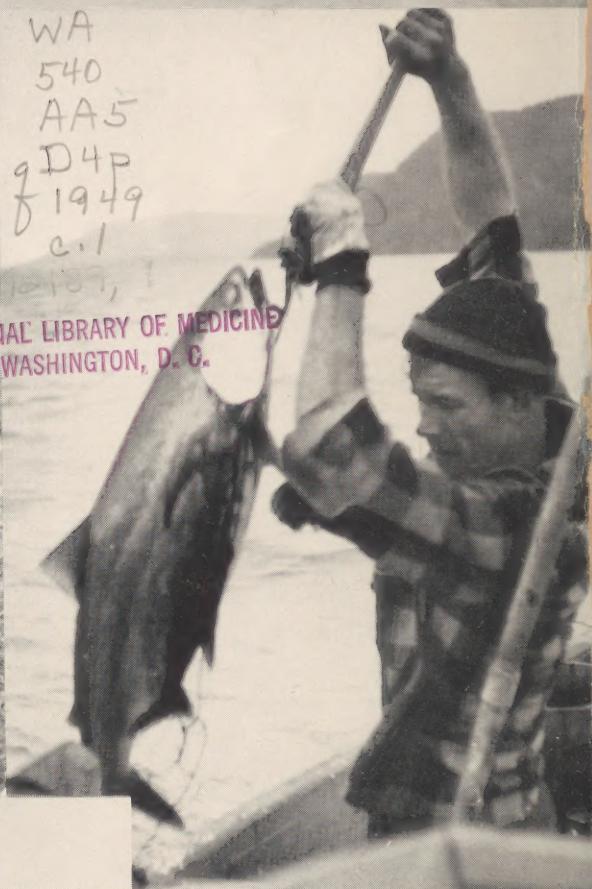
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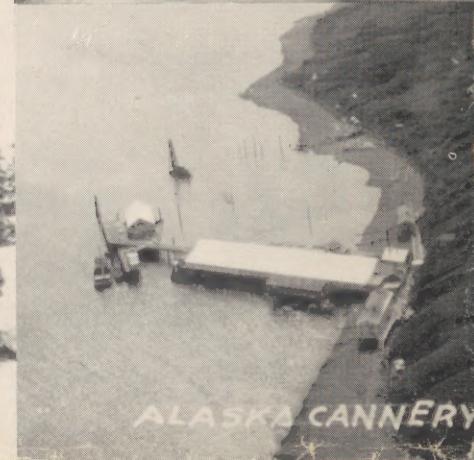
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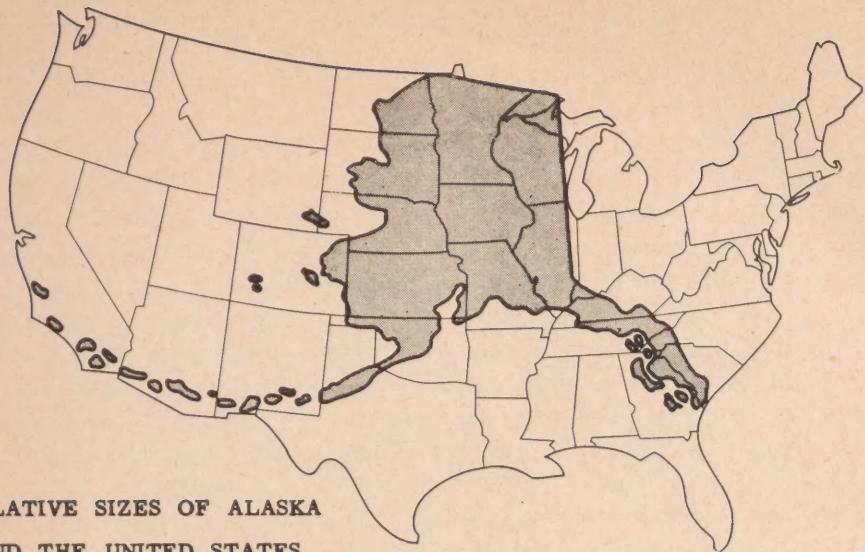


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**RELATIVE SIZES OF ALASKA
AND THE UNITED STATES**

The Territory of Alaska is equal in area to 1/5 the area of the entire Continental United States.

Within its boundaries, Alaska embraces extremes of climate, topography and health problems as varied as those found in the different sections of the United States.

Because of its vast size, its large number of small isolated communities, its peculiar terrain and weather conditions, the development of an adequate public health program for Alaska necessitates:

An increased ratio of health department personnel to population in order to maintain adequate services in all sections of the Territory. Decentralization of administrative functions, laboratory services and sanitary supervision headquarters in order that these services may be easily accessible to all parts of Alaska.

Increased travel budgets to permit travel of field personnel over greater distances at higher mileage rates.

Modification of accepted methods of sanitation and public health engineering to fit Alaska's needs.

Long term investigation and experimentation to develop methods and materials to solve public health problems peculiar to Arctic and sub-Arctic regions.

FOREWORD

The importance of Alaska to our national economy as well as its strategic position with reference to our national defense make it imperative that every effort be made to eliminate all factors which might interfere with the development of the Territory and the utilization of its resources.

The development of any area depends on colonization. Colonization in a democracy is dependent to a great extent upon the establishment of a healthful and otherwise attractive environment which will bring to the area a stable, homeseeking population. The need for creating such an environment is particularly important in the case of Alaska, since the economic pressure which brought about the mass migrations from Europe to America is not present to stimulate migration from the States to Alaska.

Alaska today is ill-equipped to provide an attractive environment or, in fact, to meet normal demands for decent housing, safe water and food supplies and minimum protection against disease. The many and serious health problems which exist in Alaska are not conducive to permanent settlement. For the sake of the economic well-being and the national security, it is essential that the basic health problems be clearly defined and the necessary measures for their solution be instituted as rapidly as possible.

This report outlines in some detail the existing health problems in Alaska; the activities, past and present, of the Alaska Department of Health and the Public Health Service; and suggestions for future programs. The material contained in this report was gathered and compiled by the Alaska Field Station of the U. S. Public Health Service at the request of the Alaska Department of Health. All proposals concerning future needs and activities included in this report are based on joint opinion of the two agencies.

Publication of the report was undertaken by the Alaska Department of Health in the belief that it contains much information of particular value and interest to persons concerned in the development of Alaska.

Personal acknowledgement due the many individuals who participated in and contributed to the preparation of this report cannot be made here. The Alaska Department of Health wishes, however, to express its appreciation to all persons whose interest and efforts have made the publication of this report possible.

C. EARL ALBRECHT, M.D.
Commissioner of Health
Territory of Alaska

CONTENTS

Frontispiece	3
Foreword	4
Alaskan Highlights	7
Part I. The Program of the Alaska Department of Health	11
A. Development of Public Health in Alaska	11
B. Organization of the Alaska Department of Health	13
C. Health and Medical Care Programs of Other Agencies in Alaska	14
D. Programs and Services of the Alaska Department of Health	18
1. Communicable Disease Control	19
2. Crippled Children's Services	30
3. Local Health Organizations	33
4. Mobile Health Units	34
5. Environmental Sanitation	39
6. Public Health Nursing	45
7. Maternal and Child Health	48
8. Public Health Laboratory Services	51
9. Health Education	53
10. Nutrition Activities	56
11. Dental Health	58
12. Mental Health	60
13. Hospital Survey and Construction	62
14. Cancer Control	65
Part II. The Program of the U. S. Public Health Service in Alaska	67
A. Organization and Purpose	67
B. Areas of Investigation and Proposed Studies	68
1. Environmental Sanitation	69
2. Entomology	71
3. Nutrition	73
4. Animal-borne Diseases	74
5. Epidemiology, Bacteriology and Parasitology	75
6. Physiology	77
7. Library	78



Purchased in 1867 for two cents an acre, Alaska has produced almost 3 billion dollars worth of gold and other materials.

ALASKAN HIGHLIGHTS

Historical Background

Historically, Alaska is little more than a hundred years younger than the Massachusetts Colony, for Vitus Bering first led his Russian expedition to St. Lawrence Island in the Bering Sea in 1728.

From that date until the United States purchased Alaska from Russia in 1867 for two cents an acre, little occurred in the Territory save for a series of Russian, Spanish, English and French expeditions which served to introduce epidemics of one disease after another among the Native population.

From the time of its purchase until 1884, Alaska was politically "the Forgotten Land." It had no representation in Congress, no power to enact laws, and no right to levy taxes.

In 1884, the first civil government was established in Alaska by Congressional action.

With the beginning of the Gold Rush in the Canadian Klondike in 1897, and subsequent discoveries of gold in Alaska in 1899, 1902, 1908 and 1910, the influx of prospectors and other settlers created a need for additional laws. In 1889 and 1900, Congress provided for a code of civil and criminal law, and in 1903 a Homestead Act was passed.

In 1906, Alaska was first empowered to elect a delegate—voteless—to Congress.

Finally, in August 1912, forty-five years after its purchase, the Territory of Alaska was created.

In 1915, the ground was broken for the Alaska Agricultural College and School of Mines, now the University of Alaska.

In July 1923, President Harding drove the golden spike at Tanana, opening the Alaska Railroad, the only railway operating completely within the Territory, covering a distance of 470.8 miles from Seward to Fairbanks.

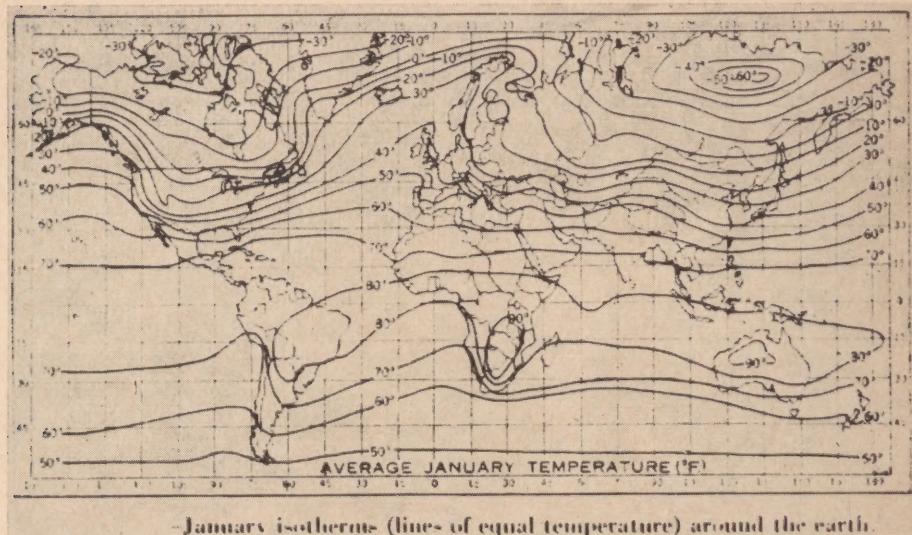
Further development of Alaska did not occur until 1938 when the strategic position of the Territory was belatedly recognized and expansion of military installations was begun.

During and since World War II, Alaska has been the scene of much activity. As a result of military developments, marked improvements in highways, air transportation and communications have been made. The continuing strategic importance of Alaska bids fair to sustain present growth and development of the Territory. The full development of Alaska, however, will depend on the ability of the Territory to provide decent housing, safe food and water supplies, proper sanitation and adequate, accessible health and medical care at a reasonable cost.

Geographical Characteristics

The Territory of Alaska, equal in size to one-fifth of the entire Continental United States, is a land of contrasts, of extremes in everything—geography, climate, transportation, and weather.

Within its three ocean borders and its Southeastern Panhandle, Alaska embraces 586,400 square miles of towering mountain ranges, fertile valleys, immense glaciers, hot springs, dense forests, tundra, muskeg, lakes and volcanoes both extinct and active.



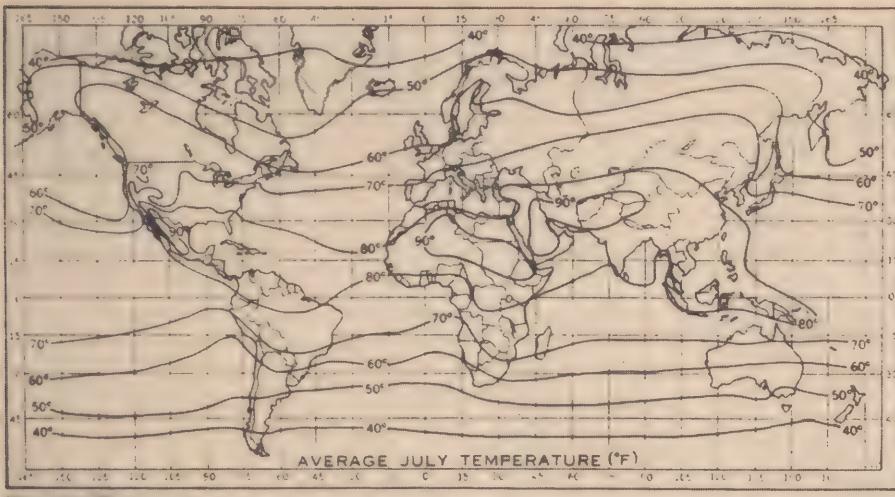
Alaska has climates to suit every taste, varying from the Southeastern section where the temperature seldom gets above 60 degrees in summer or below 20 degrees in winter to the Interior where the temperature may range from 100 degrees in summer to 76 degrees below in winter. Alaskan rainfall also varies from a high average of 180 inches per year along the Alaskan Gulf to a low of 4.3 inches at the northernmost tip on the Arctic Ocean.

Population Characteristics

According to the latest official estimates (1945), the population of Alaska is 81,441. Unofficial estimates place the current population at 90,000 to 115,000. Precise population figures cannot be quoted for Alaska because of the wide fluctuation due to changes in seasonal employment. For example, many coastal towns and villages with a permanent (winter) population of 400 to 500, may reach 2,000 to 3,000 during the summer fishing season. The majority of these transient workers are imported into Alaska from Outside by the large cannery operators.

Approximately one-third of the total population of Alaska is of native aboriginal stock—Indian, Eskimo and Aleut. Native groups are concentrated chiefly as follows: Indians in Southeastern Alaska; Eskimos along the Bering Sea and Arctic Coasts; and Aleuts in the Aleutian Chain. Accurate counts of the Native population are rendered difficult by failure of the Natives to register births and because of the ease and frequency with which they adopt new names.

The largest concentrations of non-Native population occur in Southeastern Alaska and along the railbelt from Seward to Anchorage.



July isotherms (lines of equal temperature) around the earth.

Approximately one-third of the entire population is located in the four largest cities and towns—Anchorage (estimated 15,000 to 19,000), Fairbanks (estimated 6,000 to 8,500), Juneau (estimated 5,000 to 7,000), and Ketchikan (estimated 5,000 to 7,000). The remaining two-thirds of the population are scattered throughout the Territory, the majority of them in small isolated settlements or single homesteads.

Economic Factors

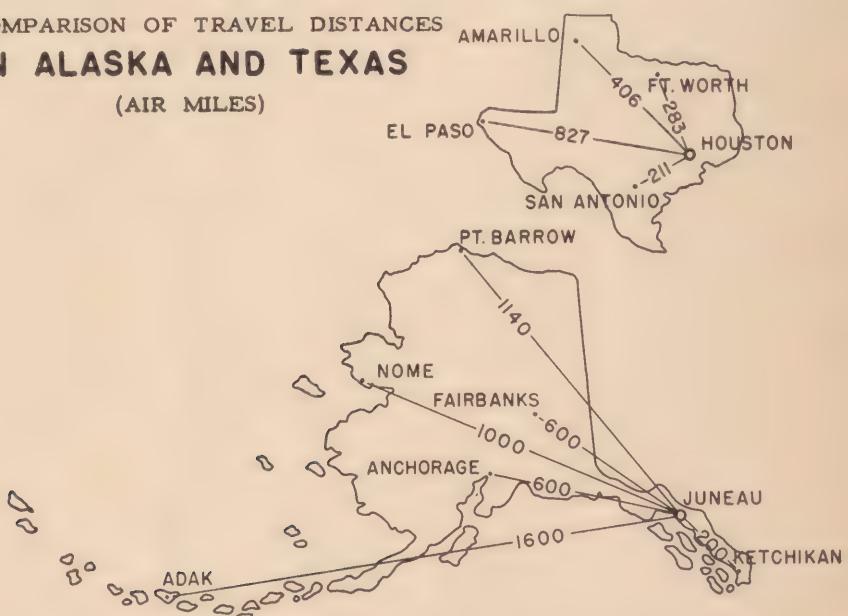
For many years, gold was Alaska's chief source of wealth. Since the time of its purchase in 1867, Alaska's total gold production has amounted to \$641,000,000. In 1946, gold production in Alaska was valued at \$7,900,000. But the fishing industry has outstripped gold production as the current source of wealth in the Territory. In 1947, the total value of the catch was 85 million dollars, 12 times the original purchase price of Alaska.

In the field of commerce, liquor stores and airlines both flourish in Alaska. There are currently 253 liquor stores (not counting bars and taverns, of which there are 28 in Anchorage alone), and 87 different airlines in Alaska.

The principal sources of revenue in Alaska are taxes and license fees from the fishing industry, excise liquor taxes, motor fuel and mining taxes. In 1947-1948, total taxes collected in the Territory amounted to \$10,369,200.

The contrasting stages of progress which still exist in the development of Alaska are typified by the fact that although the Territory boasts one of the busiest international airports in the world, many sections of Alaska are still dependent upon dog teams as the usual means of transportation in the winter. While it is undoubtedly true that Alaska would be hard up indeed without the airplane, the fact remains that the local consumer must bear the added costs of airborne commodities. Until the resources and industries of the Territory are developed to a degree where Alaskan exports equal or exceed its imports, the purchaser of the imported goods is paying for the "dead head" return trip of the plane or ship as well as for the original shipping costs into the Territory. Alaskan development has been further handicapped by the annual fall shipping strike.

A COMPARISON OF TRAVEL DISTANCES
IN ALASKA AND TEXAS
(AIR MILES)



Limited funds for highway construction kept road building at a minimum in the Territory until the beginning of World War II. Intensification of defense activities necessitated considerable highway construction, largely governed by military needs. As a Territory, Alaska is not eligible to receive a share of the funds made available by the Federal Highway Aid Act, but with the enactment of the Territorial gas tax in 1947, increased funds have been made available for road construction.

Part I

The Program of the Alaska Department of Health

DEVELOPMENT OF PUBLIC HEALTH IN ALASKA

There is little authentic information available concerning the health conditions among the Native Alaskan Eskimos and Indians prior to or immediately following the arrival of the first white men in the Territory. From the meager accounts of early explorers, there was little evidence of disease other than nutritional deficiencies.

Soon after the beginning of the series of Russian, Spanish, British and French expeditions, reference to smallpox, venereal disease and tuberculosis appear in the accounts. Smallpox seems to have caused many disastrous epidemics among the Native groups.

Perhaps the first attempt at preventive medicine in Alaska occurred when the Russian doctors began enforcing smallpox vaccination. Their efforts met with such obvious success that even the Natives themselves began to request vaccination, preferring it to the ineffective methods of their own Shaman or medicine man.

Since few of the settlements were of a permanent nature, little seems to have been done toward controlling disease on a community-wide basis until the development of the "boom towns" in gold mining days. The sudden growth of these communities eventually made it necessary that some sort of regulations be enacted. Each settlement established its own rules and regulations, chiefly concerned with the quarantine and isolation of the sick, and the burial of the dead.

Shortly thereafter, some communities set up regulations regarding water supply sources, sewage disposal and other general sanitation problems.

The first organized step in the development of public health in Alaska came in 1913 when the newly formed Territorial Legislature named the Governor of the Territory as Commissioner of Health. The Governor and three assistants, each representing one of the four Judicial Divisions into which Alaska is divided (Alaska has no counties), were responsible for all health activities in the Territory the next six years.

In 1919, the Territorial Legislature created the Office of Commissioner of Health, and the first physician to be appointed to the position took office on a part-time basis. Assisted by three part-time Divisional representatives and a part-time stenographer, the Commissioner supervised all Territorial health activities until 1936.

A series of laws were also passed by the Legislative session of 1919 which became the authority on which public health in Alaska is founded. These laws spelled out the duties of the Commissioner and his deputies and provided for the organization of Boards of Health in the various school districts of the Territory. Certain Territory-wide

regulations concerning isolation and quarantine and other procedures were also set up. These laws remained in effect virtually without change for the next 17 years.

During this 17-year period, 1919-1936, many of the organized communities within the Territory appointed local physicians as town Health Officers on a part-time basis. Since the duties of these officials were primarily concerned with the abatement of nuisances, little actual progress was made in public health development for the Territory as a whole.

When in 1936, funds for the development of health services became available to the Territory through the passage of the Social Security Act, the resultant expansion of both staff and services marked the real beginning of public health activities in Alaska. Several divisions, including those of Communicable Disease Control, Maternal and Child Health and Public Health Engineering, were immediately set up and staffed by professional and clerical personnel.

In 1937, two further pieces of health legislation of considerable importance to the Territory were passed by the Territorial Legislature. The first of these was concerned with provisions for the care of crippled children in the Territory, delegating authority to the Commissioner of Health to cooperate with and to receive and administer funds from the U. S. Children's Bureau for this purpose.

The second act established a sound basic program of sanitation, with a specific list of rules and regulations covering the various sanitation services to be included.

By 1938, the staff of the Health Department had increased to a total of 23 full-time, 4 part-time and 5 special consultant personnel. The full-time staff included 2 physicians, 11 nurses, 1 public health engineer, 1 sanitarian, 2 laboratory technicians and 6 clerical workers. Several unsuccessful attempts were made during the 1939 and 1941 biennial sessions of the Territorial Legislature to obtain passage of an act legalizing the Territorial Department of Health.

Shortly after the declaration of war in 1941, Alaska became a front line of defense. The rapid development of defense activities created an ever-increasing demand for public health services, at the same time reducing the number of persons available to render the needed services. The loss of personnel and the severe restrictions on travel in Alaska during the war years reduced public health activity to emergency measures.

The restoration of routine public health services since the cessation of hostilities has been a slow uphill process. In 1945, the Territorial Legislature finally passed the act giving the Health Department legal status. With the passage of the act, the Legislature created the first Territory-wide Board of Health which in turn selected and employed the first full-time Commissioner of Health for a four year term.

Within a few months of its creation, the Board of Health held its first meeting, at which a comprehensive public health program was outlined. The Board of Health urged that, if the people of Alaska approved, the Governor call a special session of the Legislature to take specific action concerning Alaska's tuberculosis problem.

In response to public demand, the Governor called an extra-ordinary session early in 1946. This extra-ordinary session proved to be a significant event in the annals of public health, not only for Alaska but everywhere. During this session, both Houses of the Legislature passed unanimously an all-inclusive tuberculosis control bill backed by an appropriation of a quarter of a million dollars.

The impetus provided by the special session continued to influence legislative action. During the next regular session in 1947, the Legislature almost tripled the appropriations for health and sanitation purposes. Furthermore, the appropriation was made in a lump sum, giving the Health Department much greater latitude in budgetary decisions.

Despite the increases in Territorial appropriations, Alaska was still faced with tremendous problems in health and sanitation created by the mushroomlike growth of certain areas as a result of the postwar boom in Alaska. During 1947 and 1948, several of the Federal agencies concerned in the development of Alaska requested that the National Congress give special consideration to the health problems of the Territory.

In June 1948, after extensive committee hearings, Congress passed a special appropriation of \$1,115,000 for "Disease and Sanitation Investigations and Control, Territory of Alaska." Through this appropriation, special funds were made available to implement the program of the Territorial Department of Health, and to permit expansion of existing services.

In the six months which have elapsed since the Alaska Grant was passed, public health activities in Alaska have been expanded and intensified in several respects. The present report includes a review of the changes which have been instituted and the plans which are being formulated for further development.

ORGANIZATION OF THE ALASKA DEPARTMENT OF HEALTH

The control of public health activities in Alaska is vested in the Alaska Board of Health, which consists of the Governor and a representative from each of the four Judicial Divisions. The Board of Health appoints the Commissioner of Health as the chief executive of the Alaska Department of Health.

Organizationally, the Alaska Department of Health is made up at

the present time of six Divisions and six Units, including the following:

Divisions: Communicable and Preventable Disease Control

Tuberculosis Control

Public Health Nursing

Public Health Laboratories

Maternal and Child Health and

Crippled Children's Services

Sanitation and Engineering

Units: Health Education

Nutrition

Hospital Survey and Construction

Medical Social Service

Dental Health

Mobile Health

According to the present pattern of administration, each Division Director and each Unit Head is directly responsible to the Commissioner of Health. The rapid expansion of the Department has made this procedure impractical, and extensive administrative reorganization is contemplated. In view of this impending reorganization, no further discussion of the administrative plan is included in this report.

HEALTH AND MEDICAL CARE PROGRAMS OF OTHER AGENCIES IN ALASKA

A complete discussion of the activities of the Alaska Department of Health must necessarily include a brief review of all health and medical care services available in the Territory.

No attempt is made here to evaluate the services offered by agencies other than the Health Department and the Public Health Service. Although there appears to be no duplication of services among the several agencies administering health programs in Alaska, it seems inevitable that some overlapping should occur in administration. It is felt that further studies relating to the overall administration of health services in Alaska should be undertaken.

The two major Territorial agencies providing health or general medical services in Alaska are the Alaska Department of Health and the Alaska Department of Welfare. A detailed analysis of the activities of the Health Department is included in a later section of this report.

Alaska Department of Welfare.

This agency provides a limited amount of funds for general medical care and hospitalization of indigent persons in Alaska.

The funds are appropriated biennially during regular sessions of the

Legislature. In past years, approximately two-thirds of the total appropriation has been expended for general medical care and hospitalization. The funds are sufficient to provide medical and hospital care for only a portion of eligible persons applying for such aid. The welfare problem in Alaska appears to be growing in proportion to the increasing migration of unskilled labor into the Territory.

During the 1947 Legislative session, the total funds were cut from \$300,000 to \$200,000, and the portion budgeted for hospital and medical care was reduced from two-thirds to one-half the total appropriation or -100,000.

The major Federal agencies, exclusive of the National Military Establishment, concerned with the provision of health and medical care funds and/or services in Alaska are the Alaska Native Service, the Fish and Wildlife Service, and the Alaska Railroad, in the Department of the Interior; the Public Health Service and the Children's Bureau in the Federal Security Agency; and the Veterans Administration.

The Alaska Native Service

The Alaska Native Service is the field office of the Bureau of Indian Affairs, Department of the Interior, which administers the program for approximately 36,000 Native people in the Territory of Alaska.

The health program is an integral part of the total Alaska Native Service program which includes Education, Welfare and Relief, Development and Conservation of Resources, and other related services. The health program provides medical care, hospitalization, public health nursing service, as well as transportation of patients requiring such care.

Hospital facilities and services provided by the Alaska Native Service include the following:

A total of approximately 420 beds are provided in 7 hospitals, ranging in size from 16 to 220 beds, operated by the Alaska Native Service, including approximately 200 beds for tuberculosis and 65 beds for orthopedic cases.

Orthopedic cases selected by the Crippled Children's Services of the Health Department are admitted to the Alaska Native Service Hospital at Mt. Edgecumbe. The Crippled Children's Services pays a proportionate share of the per diem cost per patient and provides certain specialized equipment and specially trained personnel.

The facilities of private hospitals are utilized, and a number of practicing physicians serve part-time under contract with the Alaska Native Service.

Facilities under construction include a 200 bed tuberculosis hospital at Mt. Edgecumbe and four quonset hut additions to existing hospitals, which are to be used for tuberculosis patients. Bids will soon be let for a hospital at Anchorage to provide 300 beds for tuberculosis and 100 beds for general medical and surgical cases.

The full-time physicians attached to the hospitals make field trips as circumstances permit, rendering a wide variety of services, including preventive measures as well as treatment of disease and injury.

As the public health nursing services of the Alaska Department of Health are being extended, the nurses employed by the Alaska Native Service are being withdrawn. Thus the public health program of the Territory, supported by contractual agreement between the two agencies, provides care for Natives as well as non-Natives in a given area.

Fish and Wildlife Service

The Fish and Wildlife Service provides limited medical and hospital services for employees engaged in the fur-seal industry in the Pribilof Islands, 200 miles north of the Aleutian Chain in the Bering Sea.

The agency maintains a small (8 bed) hospital on St. Paul Island staffed by a medical officer, a dentist, and a nurse. The hospital has a laboratory and X-ray facilities, and a dental clinic.

The Fish and Wildlife Service also provides a physician on St. George Island, with a combination office and small laboratory.

Patients requiring prolonged hospitalization are usually transported by plane or ship to the Indian Hospital at Tacoma, Washington.

Alaska Railroad

The Alaska Railroad provides a comprehensive medical and hospital care program for approximately 2,000 employees.

Medical care is provided through contracts with private physicians in Seward, Anchorage, Palmer and Fairbanks.

Hospital care is provided through contracts with hospitals in these towns.

U. S. Public Health Service

The program of the Public Health Service is discussed in Part II.

Children's Bureau

Grant-in-aid funds made available to the Alaska Department of Health through the Children's Bureau are utilized to assist in financing Maternal and Child Health and Crippled Children's Services.

Veterans Administration

Health services provided by the Veterans Administration are limited specifically to the 9,000 veterans reported as living in Alaska as of September 1, 1948.

Although the Veterans Administration does not maintain or operate any facilities of its own in the Territory, medical and hospital care are

made available to veterans through contract services with government and non-government agencies and facilities, and with private practitioners.

Personnel employed in connection with the medical program for veterans in Alaska as of June 30, 1948, totaled 26½, including one full-time and one half-time medical officer, one full-time dental officer, one social worker and 17 staff members included in the vocational rehabilitation program.

A total of 4,322 medical and dental services were rendered veterans on a fee basis during the year 1948.

Mental Health Provisions

There is no organized program for care of mental illnesses in Alaska. Mental patients from Alaska are hospitalized at Morningside Hospital, Portland, Oregon, through contract arrangements with the Department of the Interior.

An average of 350 patients are hospitalized each year. Costs of travel to and from the hospital are provided for all patients committed, in addition to the actual costs of hospitalization.

Voluntary Health Agencies

The two chief voluntary health agencies in Alaska, the Alaska Tuberculosis Association and the Alaska Crippled Children's Association, have given active assistance in the development of health programs in the Territory.

Both agencies disseminate educational material and raise funds to carry out allied programs, and assist the Department of Health in meeting special problems peculiar to Alaska.

The Alaska Tuberculosis Association has been instrumental in promoting chest X-ray surveys and in bringing to the Territory vocational rehabilitation personnel to work in the sanitoria.

The Crippled Children's Society has contributed notably to the funds for transportation and hospitalization of crippled children in Alaska.

The newly organized Alaska Chapter of the American Cancer Society is expected to strengthen the educational program in Cancer Control which has been established by the Alaska Department of Health.

The American Red Cross has contributed to the health services of the Territory in several ways. At the end of the war, the area office turned over to the Commissioner of Health a considerable quantity of its surplus supplies, including plasma, which have been distributed to hospitals and health centers throughout Alaska. Local Red Cross Chapters are encouraged to provide funds for employment of graduate nurses in the Territory in case of emergency or epidemic, and to maintain rosters of graduate nurses available for emergency duty. At

present, arrangements are under way for the organization of courses of home nursing instruction. These courses are to be conducted by a full time qualified instructor in the congested Fairbanks and Anchorage areas where shortages of hospital beds make instruction in home care imperative.

PROGRAMS AND SERVICES OF THE ALASKA DEPARTMENT OF HEALTH

The Alaska Department of Health is faced with the necessity of providing a "custom built" public health program, specifically designed to fit the peculiar needs of Alaska.

Those factors which have made the most direct influence on the development of the Alaska Health Program include:

The wide dispersion of the population and the presence of numerous geographical barriers, which require the development of new public health techniques.

The high cost of rendering public health service in Alaska caused by the scattering of the population, and the high cost of living and travel in the Territory.

The lack of basic knowledge regarding the extent and nature of many Alaskan health problems, and the need for long term investigation for the development of practical solutions.

The existence of unusually critical health situations in relation to such problems as tuberculosis control, crippled children's services, and environmental sanitation.

The concentration of medical personnel and facilities in a few



Community X-ray surveys have located 1,916 active cases of tuberculosis.

towns, leaving many sections of Alaska without ready access to needed medical service.

The absence of suitable political sub-divisions upon which to build the usual pattern of local health administration.

An analysis of each of the programs of the Alaska Department of Health follows:

Communicable Disease Control

Tuberculosis Control

As of October 1, 1948, there were an estimated 4,000 active cases of tuberculosis in Alaska.

As of October 1, 1948, approximately 50% of the estimated population of Alaska had received chest X-rays, and the names and addresses of 2,270 cases of tuberculosis were on record.

As of the same date, 451 of the known cases were hospitalized, and 412 cases with positive sputum were awaiting hospitalization.

Approximately 1,300 cases were living under conditions in which no means of isolation were available.

The average annual death rate from tuberculosis in Alaska during the period 1941-1945 was 367 per 100,000 population. The average annual death rate in the United States during that same period was 42.4. Thus the Territorial rate is almost 9 times that of the rest of the United States.

There were 400 beds available for isolation and treatment of active tuberculosis in Alaska as of October 1, 1948.

According to medical authorities:

Alaska should have a minimum of 1,000 beds for tuberculosis.

Each existing case not isolated is a potential source of infection for 9 other cases. Therefore, theoretically the 512 known non-hospitalized cases in Alaska could result in 3,000 to 4,000 new cases.

The estimated 1,730 undiscovered active cases could seriously cripple an added working population of 10,000 to 15,000 individuals.

Program Prior to July 1, 1948

Case-finding.

The M/S Hygiene¹, covering the coastal area from Ketchikan to Nome, X-rayed 13,341 persons, locating 756 cases of tuberculosis since its inauguration in 1944.

The Mobile Highway Unit¹, added in the summer of 1946, covered the highways, X-raying 896 persons, locating 88 cases of tuberculosis.

A third portable X-ray Unit has been transported by water, rail, highway and air to isolated communities, X-raying 30,672 persons, locating 1,072 cases of tuberculosis.

¹See Subsection Mobile Health Units.

These three mobile units reached a total of 44,882 persons and located 1,916 cases showing evidence of tuberculosis.

4,000 additional persons were X-rayed by private physicians, yielding an additional 354 cases.

Hospitalization.

Prior to 1945, there were approximately 70 beds in Alaska for isolation of tuberculosis.

In 1945, the Alaska Native Service established a sanatorium at Mt. Edgecumbe (near Sitka) which accommodated 156 tuberculosis patients.

In 1946, a sanatorium was opened at Seward, operated by the Methodist Mission Board, and accommodating 130 patients by July 1, 1948.

The 21 general hospitals maintained by the Alaska Native Service, church, community or other groups, included a total of 280 beds for tuberculosis patients.

Funds for hospitalization were obtained through appropriations of the Alaska Department of Health, the Alaska Native Service, and the Veterans Administration.

Tuberculosis Education.

Intensive educational programs, using all available media, such as lectures, radio and exhibits, were conducted in each community prior to the mass X-ray surveys.

A series of 6 teaching aids on tuberculosis in Alaska were prepared in 1947 for different grade levels and distributed to teachers throughout the Territory.

A handbook on the "Home Care of the Tuberculous in Alaska" was



Local
organizations
cooperate
in
community
X-ray
programs.

published in 1947 as a cooperative project between the Alaska Native Service, the Alaska Tuberculosis Association, and the Alaska Department of Health. This handbook has proved a great adjunct to personnel in the field who are responsible for supervisory home care.

Case Registry.

A central case registry was established in Juneau in 1947, to keep active records of all cases of tuberculosis found and reported in the Territory.

Pneumothorax Clinics.

Three pneumothorax refill clinics for treatment of ambulatory patients were established in connection with hospitals or sanatoria, in Juneau (1947), Sitka (1948), and Seward (1948).

Medical Social Service.

The establishment of a Medical Social Service Unit in the Health Department in 1947, with the assignment of a full-time Medical Social Service Consultant to the staff, has benefited both the Tuberculosis Control Program and the Crippled Children's Services.

The appointment of this consultant and the subsequent assignment in 1948, of a medical social worker to the staff of the Seward Sanatorium, have facilitated direct service to the patients regarding personal problems which often influence their physical progress. It has also provided a more satisfactory method of obtaining information, by field consultation and by correspondence, concerning the patient's home situation, an important item in determining the need for foster home care or other services for discharged patients.

Program Since July 1, 1948

Administrative.

A tuberculosis consultant has been added to the staff of the Anchorage Branch Office in order that the Tuberculosis Control Program for Interior Alaska may be conducted from that office.

Case-finding Program.

A fourth mobile X-ray Unit has begun case-finding activities in isolated Arctic areas. An additional unit is to be set up shortly to cover the villages in the Bristol Bay region where Native cannery workers are concentrated.

Case-finding campaigns are being organized to X-ray—

In-patients in all Territorial Hospitals.

Out-patients of all Alaska Native Service Hospitals.

Employees of all hospitals.

Three additional X-ray units are being set up in the three new mobile health units. (See Subsection 5. Mobile Health Units.)

Hospitalization.

Additional facilities and beds for isolation of active cases have been authorized as part of the Alaska Native Service Program. The proposed facilities are now in the following stages of planning or construction:

300 additional beds are being planned for Anchorage. (400 beds needed; 300 now authorized.) This facility will be under construction by Spring of 1949.

A 20-bed tuberculosis isolation unit (quonset type) is scheduled for completion at Bethel by the end of 1949.

A 20-bed tuberculosis isolation unit (quonset type) is scheduled for Kanakanak before the end of 1949.

A 20-bed tuberculosis isolation unit (quonset type) is to be completed at Kotzebue in 1949.

A 20-bed tuberculosis isolation unit (quonset type) is scheduled for Pt. Barrow.

A 200-bed addition is now under construction at Mt. Edgecumbe.

Tuberculosis Education.

An experimental program of intensive in-sanatorium education is being developed in Juneau. Physicians and nurses of both the hospital and the Department of Health staffs are working with the health education unit on plans for instructing patients in the basic principles of tuberculosis control, home care and general health education. Purpose: To accelerate rehabilitation and discharge of patients in arrested stages in order to release beds for care of acute cases.

Case Registry.

The recording of known cases in Case Registers at Juneau and Anchorage is continuing.

Pneumothorax.

13 additional pneumothorax clinics are being planned, and will be located in the following cities and towns: Ketchikan, Wrangell, Petersburg, Skagway, Anchorage, Palmer, Fairbanks, Nome, Bethel, Kanakanak, Tanana, Pt. Barrow and Kotzebue.

Special Programs.

BCG vaccination program—A study of the effectiveness of the BCG vaccine was begun in Alaska by Dr. Joseph Aronson in 1935. Work was started under the auspices of the Alaska Native Service, the U. S. Public Health Service and the Henry Phipps Institute, among the Natives in Southeastern Alaska, and has been extended to include the Eskimos along the Arctic Coast, and the Aleuts and other groups in the Aleutian Chain and in the Interior. In September 1948, a specially trained field unit was established by the Alaska Department of Health to travel throughout areas of high tuberculosis

incidence. Additional teams are being organized with the eventual hope of reaching:

All groups and individuals with negative tuberculin reactions—Native and white—living in areas of high incidence of tuberculosis.

All persons whose work brings them into close contact with tuberculous individuals.

If possible, all newborn infants.

In the interests of economy these BCG teams will also carry on venereal disease case-finding and treatment, render emergency medical care in isolated areas, and provide a limited general public health program in areas visited.

Streptomycin evaluation programs—Through special research grants, evaluation studies of the effectiveness of streptomycin in the treatment of bone and pulmonary tuberculosis were instituted at the Orthopedic Hospital at Mt. Edgecumbe and the Seward Sanatorium. Results since the inauguration of the programs in July, 1948, although inconclusive, are encouraging. The evaluation studies will be continued.

Future Plans and Suggestions for Further Development

The program for hospitalization of tuberculosis patients should be expanded and accelerated through the provision of increased funds earmarked for this purpose.

More facilities for hospitalization are planned. A minimum of 1,000 beds for tuberculosis hospitalization in Alaska has been established as an immediate goal. Emphasis will be given first to the provision of beds for the following types of patients:

Active cases of tuberculosis with favorable prognoses for rehabilitation through surgical procedures.

Active cases with unfavorable prognoses where the home situation is such that the case should be isolated for public health reasons.

Terminal cases requiring custodial care.

Expansion of the present limited rehabilitation program is being planned in order that suitable occupations may be found for arrested cases thus permitting those patients to return to as near a normal life as possible, as rapidly as possible.

The medical social service program is to be expanded so that closer attention can be given to the problem of providing foster homes for arrested cases whose own home environments might endanger their recovery.

The BCG program will be further expanded and more closely integrated with the generalized health program.

As a further means of prevention of spread of tuberculosis, it is proposed that routine chest X-rays be required of all seasonal employees brought into the Territory.

The tuberculosis education program is being extended to reach all individuals in the Territory, using original materials suited to needs of specific areas and groups.

In view of the number of medical social problems usually associated with the hospitalization and discharge of tuberculosis cases, it is proposed that the medical social service program be extended in the following ways:

Through the assignment of a medical social worker, possibly on a demonstration basis, to one of the Mobile Units, to work out a plan for securing more adequate information concerning patient's background and to promote closer relationships between home and hospital.

Through the assignment of a medical social worker, on an itinerant basis, to serve several small hospitals simultaneously. The latter step is recommended especially in view of the proposed increase in the number of small isolation units for tuberculosis patients.

Joint planning on the part of all agencies concerned with the tuberculosis problem is essential to the establishment of a sound, adequate control program. The Alaska Department of Health, the Alaska Native Service, the Alaska Department of Welfare, the Veterans Administration, the U. S. Public Health Service, the Children's Bureau, and the Social Security Administration are the major governmental agencies involved.

Venereal Disease Control

No accurate figures are available concerning the incidence of venereal disease in Alaska. As of August 31, 1948, the Case Registry for syphilis contained 641 sero-positive cases; 386 known cases of syphilis; or a total of 1,027 probable cases in all. Routine blood testing in certain communities revealed that the proportion of the population infected with syphilis was as high as 40%.

Commercial prostitution flourishes throughout the Territory. So-called "lines" openly operate in several major cities. Alcoholism is widespread in Alaska and intensifies the venereal disease problem.

Because of the wide scattering of the population and the lack of clinical facilities in the Territory, the major portion of the venereal disease treatment program is carried on by private physicians, who are paid by the Alaska Department of Health on a fee basis for cases treated. The costs of patient transportation to and from treatment centers are paid by the Alaska Department of Health in case of indigent patients.

Pre-marital blood tests are not required in Alaska.

The present case-finding programs are inadequate and are limited to the larger communities of the Territory.

Program Prior to July 1, 1948

There was no full-time Venereal Disease Control Officer in Alaska. The personnel concerned with the Venereal Disease Program included one field physician, who also served as Director of the Division of Communicable Disease Control, a clinic nurse attached to the Mobile Field Unit, and one clerk.

A Case Registry for syphilis was established May, 1948 for the purpose of recording all cases suspected of having syphilis. Individuals who had had two or more positive serological tests were rechecked by correspondence with the physicians who submitted the blood specimens.

A few surveys have been conducted in selected communities, but no basic case-finding program has been possible.

Mobile Units collected blood samples routinely during visits to isolated communities. The reports of positive laboratory findings were sent back to nurses, teachers or other authorities in the community. The follow-up of such cases generally consisted in the notification of the patient by the nurse or teacher, if the patient could be located, urging him to go to a physician for treatment. If there was no doctor in the community or near by, the matter usually ended there.

The payment of fees to private physicians for treatment of reported cases was authorized by the Alaska Department of Health which also provided the drugs used for treatment.

Four treatment clinics for venereal diseases were established, one each at Nome, Fairbanks, Anchorage and Ketchikan, under the direction of local physicians and public health nurses. These clinics, however, treated few cases other than gonorrhea.

An in-patient rapid treatment program was established in 1947, and 19 hospitals are now under contract to provide this service.

Ambulatory treatment of patients was authorized in 1948 in areas where facilities for in-patient treatment were not available.

Campaigns for the suppression of prostitution have been undertaken at the insistence of military and health officials but with indifferent results. The lack of an educational program, the attitude of tacit acceptance of prostitution on the part of the general public, and the inadequate law enforcement programs have handicapped all attempts at suppression.

Program Since July 1, 1948

A full-time venereal disease control officer was assigned to the program as of November 1, 1948. He is to develop a complete program

including intensification of case-finding activities and expansion of the treatment program.

The control activities indicated above have been continued.

Future Plans and Suggestions for Further Development

A basic Territory-wide case-finding survey is essential in order to determine:

The prevalence of venereal disease in Alaska.

The areas and population groups with the highest incidence of infection.

Venereal disease case-finding and treatment activities will be included and intensified in the programs of all Mobile Units (including the BCG teams) as well as in the generalized public health program.

It is proposed that a public health representative or venereal disease investigator be assigned to the Fairbanks and Anchorage areas. His functions should **not** be concerned with law enforcement, but rather with improving venereal disease epidemiology, giving special assistance to public health nurses in certain venereal disease contact-tracing problems.

A constant effort will be made to stimulate interest in venereal disease control among private physicians, by participation of the Health Department in the Alaska Medical Association, and by supplying physicians with reprints of current venereal disease control publications including subscriptions to the Journal of Venereal Disease Information. The education program for physicians will include information concerning newest drugs and methods of treatment.

An organized program of public information should be set up to encourage the development of a realistic attitude toward the venereal disease problem in Alaska. In all its publications the Health Department will continue to make clear its stand against prostitution.

The establishment of a venereal disease demonstration program is recommended for the Anchorage area. Such a program could render service to about one-fourth of the entire population of Alaska and would serve as a useful demonstration for other Alaskan communities.

Joint planning should be undertaken by the Alaska Department of Health and the Alaska Native Service to permit fuller participation of the personnel of the Alaska Native Service in the venereal disease control program. The location of Alaska Native Service physicians throughout the Territory makes their cooperation in the venereal disease control program essential.

Persistent efforts will be made to encourage the development of an adequate program of law enforcement by official organizations. The

role and functions of the Health Department and those of the law enforcement agencies in venereal disease control should be clearly defined.

The death rates from the common communicable diseases listed in the following table, are several times higher in Alaska than in the United States as a whole. Although no information is available concerning the 1945 death rate for measles, this disease is considered an important cause of death among children, particularly Native children, in the 1-4 age group. In 1944, the death rate for measles in Alaska as a whole was 8.7 per 100,000 population. The measles death rate for the United States as a whole in the same year was 1.5 per 100,000 population.

Control of Other Communicable Diseases

Table 1. Deaths from Communicable Diseases: Alaska, 1945¹.

Disease	Rate per 100,000 pop. ²	Rate per 100,000 U.S. Reg. Area ³
Tuberculosis	341.4	40.1
Pneumonia and influenza	125.3	51.8
Syphilis	12.2	10.7
Whooping cough	12.2	1.3
Diphtheria	8.5	1.2
Scarlet fever	1.2	0.2
Typhoid fever and paratyphoid	1.2	0.4

The lack of adequate medical and nursing services in isolated communities has undoubtedly contributed to the high death rates from many communicable diseases.

There is a marked lack of facilities for isolation of all communicable diseases.

Activities directed toward the control of communicable diseases are included in the programs of most Divisions of the Alaska Department of Health. Personnel of the Department most closely concerned with disease control problems are the public health nurses, sanitation personnel and the staffs of the Mobile Health Units.

Territorial regulations require the reporting, by physicians, nurses and hospitals throughout the Territory, of some 32 different diseases. The actual reporting, however, is erratic and incomplete.

¹Source: Special Reports: Summary of Vital Statistics, Alaska, 1945. 26:669, Dec. 2, 1947, U.S.P.H.S.

²Based on estimated civilian population plus residents of area serving in armed forces, 1945 = 81,441.

³Source: Vital Statistics of the United States, Part 1, 1945, P. 9.

Program Prior to July 1, 1948

There was no full-time medical director of the Communicable Disease Program. Personnel of this Division included one field physician, who was also responsible for venereal disease control activities, and a secretary.

The program of Communicable Disease Control has consisted chiefly of the following activities:

Immunization programs conducted by health centers and Mobile Units.

Diagnosis and emergency treatment of current cases of communicable disease by the personnel of the Mobile Units during their periodic visits.

Instruction in prevention, isolation and home care of communicable diseases given by public health nurses in local communities.

Activities of the Division of Sanitation and Engineering concerning the protection of food, milk, water supplies, and environmental sanitation in general.

Morbidity and Mortality Reporting:

Weekly and monthly reports of morbidity were prepared for the U. S. Public Health Service and the Commissioner of Health.

Yearly mortality reports were compiled from transcripts of death certificates furnished by the Vital Statistics Sections, which is under the Office of the Territorial Auditor.

Program Since July 1, 1948

The routine activities listed above have been continued and are being intensified through increases in the number of personnel included in the generalized health program.

Future Plans and Suggestions for Further Development

The proposal to combine the Division of Communicable and Preventable Disease Control and the Division of Tuberculosis Control has recently been carried out. It is anticipated that this move will result in closer coordination in planning for the control of all communicable diseases. Increased emphasis will be placed on the control of communicable diseases not covered by the Tuberculosis and Venereal Disease Control Programs.

Special emphasis is being given the early diagnosis and treatment of communicable diseases, especially pneumonia and whooping cough, and the early hospitalization of appropriate cases.

The programs of immunization against diphtheria and whooping cough are to be extended and intensified.

The transportation of patients in isolated areas to and from hospitals should be facilitated through the provisions of increased funds.

It is proposed that greater effort be directed toward the education of parents, teachers and other lay people in the importance of immunization, detection of early symptoms, and early medical care of communicable diseases.

The inclusion of the collection of vital statistics as a function of the Health Department is recommended for early consideration. Accurate and complete records of births, deaths, and cases of communicable diseases are essential to proper evaluation of health department programs.

Pending the establishment of a vital statistics unit within the Health Department, it is proposed that more careful analyses be made of available morbidity and mortality statistics, and that these analyses be used



Immunization clinics are conducted by all health centers and mobile units.

as a guide in program planning. The collection, tabulation and analysis of such statistical information is a basic function of all organized departments of health.

CRIPPLED CHILDREN'S SERVICES

There are 613 crippled children included in the Case Register for the Territory. In addition to those in the Register, there are undoubtedly many crippled children in Alaska who have not yet been located.

Eighty-two of the children on the Register are in hospitals, and fifty are in boarding schools in Southeastern Alaska. Approximately 300 of the known cases are in need of medical and hospital care which cannot be provided under the present budget.

There is one Orthopedic Hospital in the Territory, operated by the Alaska Native Service, with a bed capacity of 65. The Orthopedic Surgeon and Orthopedic Nursing Supervisor are provided by the Alaska Department of Health, which also furnishes special hospital equipment.

Many cases needing hospitalization have had to be, and are still being sent out of the Territory to hospitals in the States, usually at considerable expense and inconvenience.

It is estimated that 80% of the cases receiving hospital care under the Crippled Children's Program are victims of bone tuberculosis, a condi-



Six good reasons for the existence of Mt. Edgecumbe Orthopedic Hospital.

Patient
cooperation
at
Mt. Edgecumbe
hospital.



tion frequently found in homes where pulmonary tuberculosis cases exist.

Figures concerning the number of children handicapped by cerebral palsy and rheumatic fever are not available. A number of cases of cerebral palsy have been discovered by the itinerant orthopedic clinics. There is no definite program for care of cerebral palsy cases in Alaska.

Program Prior to July 1, 1948

Until 1947, all children hospitalized under the Crippled Children's Program had to be sent out of Alaska. In 1947, the first orthopedic hospital in the Territory was opened by the Alaska Native Service.

The selection of the first cases to be hospitalized was made through itinerant orthopedic clinics conducted in 10 to 12 communities in 1946-1947. Additional cases were referred to the orthopedic surgeon by local physicians, public health nurses, teachers and others.

Special cases such as cleft palates and lips must still be sent to Seattle for correction.

Since January 1948, two orthopedic cases per month have been accepted without cost to the Territory by the University of Chicago Clinics. The American Junior Red Cross pays the costs of transportation for these children.

In 1947, a plan was set up for a special project for care of children with

chronic diseases, including rheumatic fever. The program had to be postponed because of inability to secure the services of a pediatrician with special training in cardiology.

Prior to the opening of the Mt. Edgecumbe Orthopedic Hospital, medical social service was limited to the efforts of a consultant located outside the Territory in Seattle. Under the circumstances, her activities were confined to placement of children needing intermittent hospitalization in foster homes near hospitals in the States. Investigation of and contact with the homes and families of discharged patients in Alaska was carried on by local public health nurses and teachers in the various communities. Information obtained by this means concerning the home environments of the patients was usually incomplete.

The appointment of a medical social service consultant to the Health Department staff in the Spring of 1947, facilitated the development of a limited program of home contacts and foster home placement within the Territory.

Program Since July 1, 1948

The bed capacity of Mt. Edgecumbe has been increased from 50 to 65. Orthopedic itinerant clinics were held at Anchorage and Kanakanak Hospital (September 1948) for case-finding and follow-up. Sixty-one cases were found to be in need of hospitalization; eight of them were in urgent need of immediate care.

Arrangements have been completed for care of ten rheumatic fever patients at the hospital in Juneau. The appointment of a pediatric medical consultant and a pediatric nurse has been authorized.

An experimental program to evaluate effectiveness of streptomycin in treatment of tuberculosis of the bone has been instituted at Mt. Edgecumbe.

The Alaska Crippled Children's Association has authorized the appointment of a trained occupational therapist to the staff of the Orthopedic Hospital on a demonstration basis for one year.

Future Plans and Suggestions for Further Development

The provision of minimum care for crippled children in the Territory will necessitate increases in both facilities and funds. The team from the American Medical Association which visited the Territory recently has recommended a minimum of 165 beds for orthopedic cases in Alaska, an increase of 100 beds.

Plans are already in process for the provision of a more adequate program of education and occupational training for patients at Mt. Edgecumbe Hospital. Experience in institutions of a similar type has shown such programs to be of value to the patient both during his stay in the hospital and following his discharge.

The medical social service activities must be strengthened in order to build up a more adequate foster home program in conjunction with the Alaska Department of Welfare. More foster homes near treatment facilities are needed for children who do not require daily hospital care, in order to release beds for patients in acute need of such care. More detailed information can also be secured through this program concerning the home environments from which child patients come and to which they must return following discharge.

With the assistance of the staffs of all Mobile and Field Units, a definite attempt will be made to determine the true incidence of cerebral palsy and rheumatic fever in Alaska.

As soon as personnel and funds become available, a special study will be undertaken to determine the effect of Alaskan climate, housing, and nutrition on rheumatic fever.

LOCAL HEALTH ORGANIZATIONS

The sparsity of the Alaskan population and lack of suitable political sub-divisions has delayed the establishment of local health services on a decentralized basis.

Local health services are provided largely through the Mobile Units and public health personnel (principally public health nurses and sanitation workers) under the administrative direction of the Headquarters Office in Juneau or the Branch Office in Anchorage.

There is no local health organization with full-time medical direction in Alaska. The larger towns employ a part-time health officer; other communities have public health nursing service on a full-time or itinerant basis.

Local health services on the itinerant basis are provided to a limited extent by personnel of the Central Office staff in Juneau and of the Branch Office staff in Anchorage.

Local contributions for the maintenance costs of 15 local health centers, participation in the public health nursing program, and the payment of the salaries of part-time health officers total \$59,000.

Program Since July 1, 1948

Plans are being made for the development of Public Health Districts under medical direction covering the entire Territory. These will provide for a decentralized administration of public health services.

Positions have been set up for full-time health officers in the Anchorage and Fairbanks areas.

Future Plans and Suggestions for Further Development

Present plans to place the administration of the Mobile Health Units and local health services under the proposed Division of Local Health

Service will be effected as soon as possible. It is also proposed that the possibility of placing the BCG teams in this Division be considered since their programs are to be expanded to include all the services of a generalized program.

It is proposed that a carefully planned training program be developed for the purpose of providing a corps of non-professional health workers among the regular residents of small isolated communities. These workers would serve as contact persons for full-time Health Department personnel, and would be responsible for local health activities in the absence of professional health workers. The health problems peculiar to Alaska require the development and use of techniques which differ radically from those normally used in conventional public health programs in the States. Since it will probably never be feasible to station a trained public health nurse in each small Alaskan community, it is felt that the suggested program would be beneficial in providing trained lay workers for areas where there would otherwise be a complete absence of health personnel.

MOBILE HEALTH UNITS

Mobile Units are essential for the provision of health services in Alaska. Many areas of the Territory are so isolated that services must be brought to the people by water, air or land routes. The majority of the villages visited thus far by Mobile Units had had no previous contact with medical or public health service of any kind until these special units were established.



M/S Hygiene carries health services to coastal villages from Ketchikan to Nome.

Mobile Units have proved effective:

- In providing a generalized health service for isolated communities;
- In locating and bringing under treatment unknown cases of tuberculosis, venereal disease, and other communicable diseases;
- In finding cases needing hospitalization because of crippling conditions due to disease or accident; and
- In uncovering environmental problems in need of intensive public health service.

The services of the Mobile Units:

- Have been well received by Native groups;
- Have stimulated local interest in health betterment;
- Have brought professional personnel in outlying areas into contact with newer methods and information; and
- Have given many communities the benefit of modern health facilities otherwise completely unavailable.

Program Prior to July 1, 1948

M/S Hygiene

In 1944, in recognition of the fact that public health services in Alaska needed to be taken to the people, a small vessel was purchased through surplus property and equipped to give public health, medical, nursing, bacteriological and X-ray services to communities in Southeastern Alaska.

It soon became apparent that the original vessel was inadequate in size for carrying out the work. Accordingly, the vessel was sold and arrangements were made through the Army for the transfer of a vessel 114 feet in length which was converted into a complete floating health center with additional direct service facilities. The FS/35, or M/S Hygiene, as the ship is designated, contains a doctor's office, nurse's office, clinic room, and secretary's office. Excellent equipment is maintained aboard in order that all necessary programs can be carried out. The professional staff consists of a field physician, public health nurse, bacteriologist, dentist and dental assistant, and a secretary.

Since its inauguration in 1944, the M/S Hygiene has visited numerous small communities along the Southeast Coast, the Aleutian Chain, and along the Bering Sea as far north as Nome. Some of these communities were visited only once; some as many as two or three times. In general, the program of the M/S Hygiene was characterized as follows:

Visits to individual communities were generally of short duration in order to cover more territory.

Emphasis was placed on chest X-rays to determine the extent of tuberculosis in areas visited, and on prenatal, pre-school and school examinations, immunizations and blood tests.



Emergency medical care was given as required and as time permitted. A limited amount of dental service was made available by the addition of a public health dentist to the M/S Hygiene staff.

Mobile Highway Unit.

In order to give a similar service to communities located along the existing highways in Alaska, an Army surplus truck was obtained and converted into a mobile health center. This unit is staffed by a field physician, a public health nurse, and a technical assistant who carries out simple laboratory procedures and does X-raying.

The Mobile Highway Unit has been covering the Richardson and Alcan highways in Interior Alaska since September 1946.

Emphasis has been placed on tuberculosis case-finding activities, but a generalized health program has been carried out by the Unit. Medical inspections of all available inhabitants, immunizations, emergency treatments, home visits, instruction in child care and feeding and general health education were all included in the program of the Mobile Unit.

Program Since July 1, 1948

M/S Hygiene.

The M/S Hygiene has continued its coastal itinerary with the following modifications of program:

Longer periods are spent at each village in order to do a more thorough job.

More time is spent in health education of both children and adults in the various communities.

The number of home visits to instruct patients and families in home care of illnesses has been increased.

Special instructions are now given for midwives.

A more intensive search for handicapped children is being carried on.

Laboratory services have been increased as follows:

Serological tests are now being done aboard ship, so that treatment or instructions may be given the patient before ship leaves port.

Testing of water samples is now included during visits.

A study is being made of specimens for possible cases of epidemic diarrhea.

Mobile Highway Unit.

This Unit extended its itinerary and public health services to include Children's Homes in the Matanuska Valley and along the Steese Highway, in addition to the areas covered in the two previous years. The program has been modified to include:

A more complete evaluation of the health status of the people in the areas covered—checking particularly on the immunization status of pre-school and school age groups.

Food handlers—examinations of employees at the many roadhouses, lodges, and Alaska Road Commission camps.



Reception committee greets X-ray plane.

A more complete program for follow-up of examination findings and treatments by the itinerant public health nurse who supplements the work of the unit's personnel.

Routine serological testing of all age groups, and all individuals, whether Native or white, (all blood samples are sent to the Anchorage laboratory) and subsequent treatment of persons found to be infected.

Additional Units.

Both the M/S Hygiene and the Mobile Highway Units have demonstrated the necessity for taking health services directly to the people. It has become evident, however, that these two units are neither sufficient in number nor of a type that can reach all areas where the services are urgently needed. There has long been a need for this type of service along the Yukon River, the Kuskokwim River, the Bering Sea, and the Arctic Ocean areas which are inaccessible to the Hygiene, and along the railbelt which is not accessible by highway. After careful investigation it has been determined that additional facilities should be added to meet the problems of transportation peculiar to these coastal and river areas during the period between break-up and freeze-up when they are accessible, and to reach railbelt settlements. The following units have therefore been acquired and are in the process of being renovated:

Self-propelled Barge Unit—A barge, self-propelled, measuring 105 feet in length, with a draft of about 7 feet, was purchased under the Alaska Grant and is now being renovated and equipped to duplicate the facilities, equipment, and staff quarters included aboard the Hygiene. This barge will work the Bering Sea-Bristol Bay areas and communities lying at the mouths of the Kuskokwim and Yukon Rivers, as well as the Arctic Ocean front and Aleutian Chain. It will be based during the winter at Kodiak as a headquarters unit base of supply.

Shallow-draft Barge Unit—An additional unit was deemed necessary for reaching the many villages along the two major streams running throughout the width of Alaska. A flat bottom barge of two foot draft was secured and will be converted into a facility similar to the self-propelled barge although on a smaller scale.

Railroad Unit—Inasmuch as there is no highway adjacent to the Alaska Railroad, it became apparent that some special facility was needed to render public health service to the people residing along this artery of transportation. Therefore hospital cars are being obtained through the cooperation of the Alaska Railroad and will be set up as a traveling health center similar to the other Mobile Units.

Future Plans and Suggestions for Further Development

The services of all the Mobile Units, both existing and proposed, will be expanded to their utmost. Each Unit will be staffed and equipped so as to

give the most complete generalized health service possible. The programs of all Mobile Units will be carefully and closely correlated with the programs and services of all Divisions of the Health Department for most efficient performance. Specifically, it is proposed that the Mobile Unit Programs be expanded as follows:

Vision and hearing tests, diagnostic examinations and treatments will be included in view of the urgent need for such services.

Dental services will be increased as rapidly as possible, first for emergency care and later for prophylaxes and remedial dentistry.

More attention will be given to observation and study of the nutritional status of the people living in the areas visited.

Routine sanitary inspections of all eating establishments, roadhouses and camps and examination of foodhandlers will be included in the programs of all Mobile Units.

ENVIRONMENTAL SANITATION

The Alaska Department of Health is responsible for carrying out 22 activities in the field of environmental sanitation.

There are 315 communities in Alaska requiring regular sanitary services. Some are so isolated that a round-trip inspection tour requires more than 4,000 miles of travel. Such communities can be reached on an average only once in 8 years with present personnel.

The recommended minimum 4 sanitary inspection visits per year to principal communities in any one district in Alaska would require approximately 15,000 miles of travel, chiefly by air at 15 cents per mile (as compared to the usual 5 cents per mile authorized in Continental United States). Thus the annual travel budget for routine sanitation supervision in one district would amount to approximately \$2,250.

80 to 90 per cent of the people in the Territory derive their water supplies from surface sources. There is not a single complete public water treatment plant in the entire Territory.

Only 10% of the sewage disposal systems in Alaska can be considered adequate. Existing sanitary facilities in many areas are outmoded, unsuited to the physical environment, or are no longer adequate to meet present needs. Many entire settlements in isolated areas, and sections of the larger cities, are still dependent on the most rudimentary methods of waste disposal. Most of the 174 communities located in the permafrost area urgently need improved methods of sanitation.

Phenomenal growth of urban centers has necessitated employment of emergency stop-gap measures of sanitation, which are inadequate for permanent development.

Sanitation Problems In



Sewer outfall at Cordova,
typical of many, discharges
sewage above low tide mark.

Home
on
piling,
Juneau.
Note
easy
waste
disposal.



Open well dip-bucket style,
numerous throughout
Alaska.

This one is located
on outskirts of Anchorage,
Alaska's largest city.



Alaska

Citizens
of
Nome
get
their
water
by
truck.



Housing in Anchorage includes everything from \$35,000 homes (upper right) to trailer shacks with privies.

Alaska's billion dollar industry—fish canneries—constitute large item in food sanitation program.

Accidents are the second most frequent cause of death in the Territory with a rate of 228 deaths per 100,000 population per year as compared to 73 per 100,000 in the States.

Alaska's growth is being blocked by the acute housing shortage. A large part of the housing in low temperature regions of Alaska is so inadequate that it constitutes a major health hazard. Packing boxes are used to construct houses; wood-sheds and garages are being made to serve as dwellings. There is a high degree of correlation between the inadequacy of housing and the high death rates from such diseases as tuberculosis and pneumonia.

Program Prior to July 1, 1948

Of the 22 activities assigned to its responsibility, the Health Department has of necessity had to emphasize those activities in greatest need of attention. Considerable time and effort have therefore been devoted to water supplies, waste disposal methods and food and food handling procedures.

90% of milk produced within the Territory is now pasteurized.

The provision of safe water supplies and sanitary waste disposal systems has had to be handled separately for each community. Research is needed before adequate sanitary facilities suited to the individual communities in areas of low temperature can be developed. Because

SANITARY STATUS OF CERTAIN ALASKAN

FACILITIES AND SERVICES

JULY 1, 1948

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Water Supplies	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Waste Disposal Systems	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Food or Milk Handling Establishments	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Garbage Disposal Systems	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Hotels, Camps, Resorts, etc.	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Housing	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Rodent and Insect Control	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Schools and Institutions	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Industries	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Barber and Beauty Shops and Miscellaneous	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

of the lack of basic research, the measures used have been largely of an emergency nature.

Routine testing of water supplies has been dependent on the cooperation of local health officers, public health nurses, school teachers and others, since only one community in the Territory employs a sanitarian. The submission of samples for testing and routine inspections of water sources has been inconsistent and erratic. The nomadic nature of many of the Native groups and the large proportion of transient seasonal workers in some areas has rendered the problem of control even more difficult.

Inspection and control of food supplies and food handling procedures has made up the bulk of the sanitation program. Since routine supervision on a local basis has been impossible, a considerable amount of time has been devoted to education of owners, operators and employees of food handling establishments. Food handler classes have been conducted in 12 towns and cities with the assistance of the Health Education and Nutrition Units. Consultation by correspondence has been maintained, and field trips have been scheduled as frequently as time and travel funds permit.

District sanitation offices established at Ketchikan and Anchorage have relieved the Juneau office and have facilitated services to South-eastern and Interior Alaska.

Health Department officials have cooperated with other governmental agencies in attempting to develop a housing program for Alaska.

About 60% of Alaska is underlaid by permanently frozen ground (permafrost). In the most northerly sections this permafrost often extends to a depth of several hundred feet.



Program Since July 1, 1948

Additional personnel have been assigned to both the central and district sanitation staffs with the resultant expansion of the sanitation program in all areas.

The opening of a fourth district sanitation office in Fairbanks has facilitated expansion of services in Upper Interior and Arctic regions.

A special program of Sanitary and Engineering Surveys is being developed in response to the need for immediate improvements in environmental sanitation. Funds totaling \$55,000 have been budgeted for survey activities. The primary objective of the surveys will be to assist each community in developing and financing sanitary facilities specifically designed to fit its particular needs. Initially, sanitary surveys of selected communities will be made by Health Department personnel. Engineering surveys will then be made through contract with private engineering firms. These engineering surveys will provide preliminary drawings of suggested facilities and cost estimates which can be used by the community in planning for its community facilities.

Future Plans and Suggestions for Further Development

A Federally sponsored community facilities program is needed in Alaska. Inadequate facilities (including housing, water supply and waste disposal systems) are a major factor in delaying the development of the Territory. The rapid growth of the population in defense areas has created sanitation problems, the solution of which lies far beyond the financial abilities of these communities. The cost of services is already exorbitant and revenues have permitted only stop-gap measures to be instituted. Local financing is out of the question if the newly-planned water and sewage facilities are to be sufficient for the anticipated growth of these communities.

In view of the unusually high rate of accidental deaths in Alaska, it is suggested that a careful analysis of the causes of accidental death be made and that an aggressive program for the prevention of accidents be developed.

The sanitation program relating to sanitary facilities for single dwellings should be expanded to include specific advice concerning suitable types of construction for homes in Arctic and sub-Arctic areas. It is contemplated that the Alaska Department of Health will coordinate its activities with those of the U. S. Public Health Service in its proposed studies relating to environmental sanitation in permafrost areas.

Needed improvements in sanitary facilities for individual communities will be carried out as rapidly as funds permit. Such improvements

will need to be worked out carefully in accordance with the ability of the community to maintain and operate the proposed facility.

PUBLIC HEALTH NURSING

Many isolated Alaskan communities are completely dependent upon the nursing staff of the Health Department for medical and public health care.

Because of the extreme isolation of many communities and the resultant lack of medical and other professional supervision, nursing personnel in Alaska must be especially well trained, thoroughly experienced, and able to maintain a generalized health program, often under rather primitive conditions.

Each public health nurse serves an average of 2,000 persons. Areas served by some nurses extend over thousands of square miles. The present number of nursing personnel is inadequate to give bedside nursing care.

The rapid growth of the population in such centers as Anchorage and Fairbanks and the acute need for nursing service in outlying areas has resulted in the overburdening of the skeleton nursing staff employed in Alaska.

Program Prior to July 1, 1948

The major efforts of the Division have been directed toward main-



What the well-dressed nurse wears in the Arctic.

taining a sufficient staff of public health nurses to carry on nursing services in connection with all programs of the Health Department.

Prior to July 1, 1948, there were 20 public health nurses assigned to field stations. The majority of them were located in larger population centers, with a few assigned to isolated communities, to itinerant services and to special projects. Nursing staffs in all cases were minimum.

Supervision was limited to the efforts of one director and two supervisors for coverage of the entire Territory.

Except for special project teams, all nursing service was generalized.

Nurses assigned to isolated areas and itinerant services were responsible for emergency treatments, inspections, screening and referral of patients and immunizations, as well as for the usual instruction in home care of patients, mothers classes and all health education activities in the community.

Program Since July 1, 1948

A total of 58 nursing positions have been authorized in the 1949 budget. 24 of the 38 field positions, 6 of the 12 administrative, supervisory and consultant, and 3 of the 8 clinical positions, or a total of 33 of the 58 authorized positions, were filled by December 1, 1948.

The number of staff positions has been increased and recruiting activities have been intensified in order to:

Strengthen the services for growing population centers.

Extend itinerant services to include the Bristol Bay, Alaska Peninsula and Bethel areas.

Strengthen nursing supervision by appointment of an educational director and two additional nursing supervisors.

Secure more clinic nurses for the BCG program and other special units such as venereal disease teams.

Through contract agreements with the Alaska Native Service, the Alaska Department of Health is assuming responsibility for the direction of the total public health nursing program for the Territory. Arrangements have been completed for assuming this responsibility in Southeastern Alaska and for extending these arrangements to other areas of the Territory as rapidly as public health nurses can be secured.

Plans have been established for financing basic public health training for graduate nurses in the States. When training is completed, the trainees are committed for two years of service in Alaska.

More nurses are being sent Outside for special summer courses under the expanded program of in-service training.

Future Plans and Suggestions for Further Development

It is contemplated that a total of at least 55 field nursing positions will need to be set up in the Alaska Department of Health within the next five years in anticipation of the continued rapid growth of the population. An additional number of supervisory, consultant and clinical nursing positions will need to be authorized, depending on the rate of development of the various programs of the Alaska Department of Health.

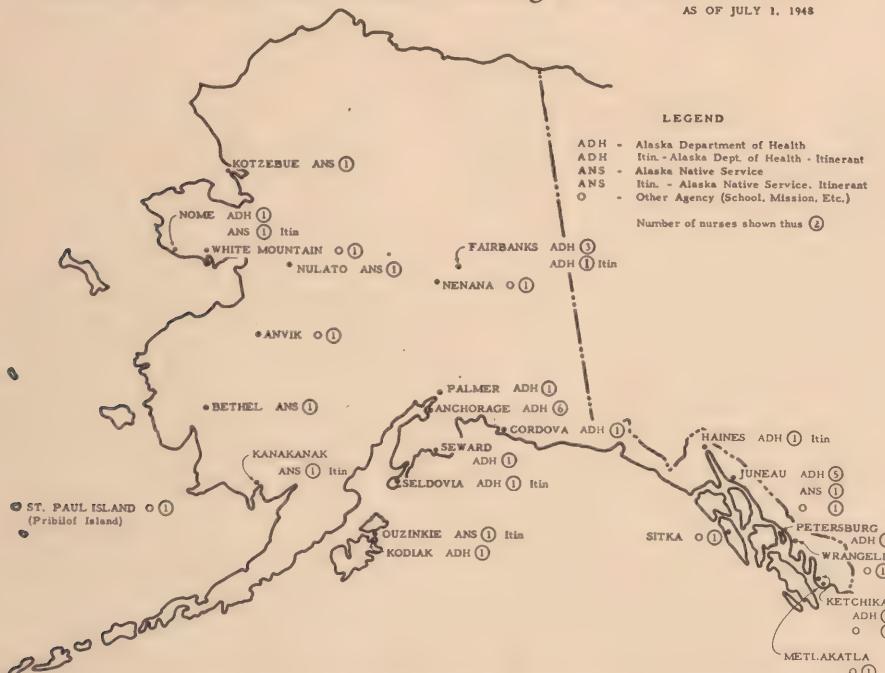
Present plans for the rotation of field staff nurses to sanatoria and orthopedic hospitals for in-service education will be completed and put into operation as soon as possible.

Nursing personnel, particularly field nurses in isolated areas, are being encouraged to make accurate observations and records of infant and maternal mortalities as a basis for developing a program of maternity care for all sections of the Territory.

It is proposed that specific studies be undertaken to determine the extent to which nurse midwives and non-nurse midwives can and should be utilized in the maternity program.

Distribution of Public Health Nursing Personnel in Alaska

AS OF JULY 1, 1948



NOTE: The following Public Health Nursing Personnel should be included in the above map: Eagle—O (1); Valdez—A.D.H. (1) Itin.; Wrangell—A.D.H. (1); M/S Hygiene—A.D.H. (1).

MATERNAL AND CHILD HEALTH

No accurate or complete up-to-date information is available concerning maternal and infant deaths in Alaska. The most recent figures (1945) indicate an infant mortality rate of 75.5 per 1,000 live births as compared with a rate of 38.4 for the United States. It is significant that one-half or more of the infant deaths were due to preventable causes. An analysis of available statistics shows that 69.7% of the 1,829 births which occurred in Alaska in 1945 were medically attended, either within or outside institutions. Of the 1,829 births, 48.6% of the births to non-white mothers were medically attended, and 51.3% were attended by midwives or other non-medical persons.

There is no licensure program for midwives in Alaska.

Prenatal care and instruction is available only to those mothers who can afford a private physician, where they are available, or who live in areas served by public health nurses or the Mobile Units. There are virtually no facilities for care of premature infants in the Territory. For these reasons a midwifery program is definitely needed.

There are no pediatricians in the entire Territory. Child health conferences and immunization programs are limited to:

Those communities having part-time health officers and/or local public health nurses.

Those communities receiving periodic visits from Mobile Units or itinerant public health nurses.

Communities in which private physicians are willing and able to give time to such programs.

Yearly physical examinations of all school children are required by law in Alaska. These examinations are performed for the most part by local private physicians.

Specialized health services for children, such as dental health, vision and hearing conservation, and eye, ear, nose and throat examinations, have not been available in Alaska until recently, and now only on a very limited scale. The recent American Medical Association survey team estimates that from 22 to 50 per cent of the Native children have visual defects.

Program Prior to July 1, 1948

Such services as have been available for mothers and children in the Territory have been provided chiefly by local public health nurses and the Mobile Units.

The programs of the Mobile Units include prenatal, preschool and school examinations, immunization, and instructional programs for mothers and teachers in the villages visited.

Local public health nurses have been responsible for follow-up of prenatal and other cases referred to them after visits of the Mobile Units. These nurses are also responsible for emergency delivery services in areas where medical help is not available.

Public health nurses assigned to towns and villages organize and conduct periodic immunization clinics and child health conferences where the services of local physicians are available.

Itinerant public health nurses include maternal and child health services in their programs.

The addition of a public health dentist to the staff of the M/S Hygiene has made possible the inclusion of a limited amount of dental work with children. Because of the short time spent in each village, and because of the lack of previous attention, most of the dental services have been emergency measures.

The single ophthalmologist in the Territory conducted clinics in 10 or 12 Arctic villages during 1947. Services included examination, refraction and some corrective surgery.

Program Since July 1, 1948

A position for a medical consultant in Maternal and Child Health has been established in the Anchorage Branch Office for the purpose of coordinating the services in Interior Alaska. The physician will conduct demonstration clinics, and will be responsible for planning and con-



Well baby clinic at Anchorage health center.

ducting a midwifery and premature program in Anchorage and surrounding territory.

A midwifery program has been initiated with the assignment of a nurse-midwife to the Health Department staff to work wit' field nurses.

The program is being extended on an itinerant basis to areas in most urgent need of assistance.

A full-time dental unit has been established at the Mt. Edgecumbe Hospital under the direction of a full-time dentist employed by the Alaska Native Service. The addition of two itinerant dental teams, each consisting of a dentist and a dental assistant, is planned.

Future Plans and Suggestions for Further Development.

It is proposed that a midwifery program for training nurse-midwives be developed in order to:

Extend present midwifery services.

Work with Native midwives already practicing in Alaska.

Because of the difficulties entailed in the proper care of premature infants under existing conditions in Alaska, it is proposed that a program be developed to provide special training for physicians and nurses in the care of premature infants, with provisions for hospitalization of such infants whenever and wherever possible.

In view of the high incidence of visual and hearing defects among



Annual school physical examinations are required by law in Alaska.

and individual and our party will be able to make a
certain difference without causing trouble individually

A survey only, at this time, has been initiated to determine future plans for better maternity care.



Infant and maternal health services are carried to coastal villages by M/S Hygiene.

Alaskan children, it is planned that examinations and diagnostic services for such defects among children be expanded and included in the programs of all Field Units.

Existing maternal and Child Health services will be expanded by means of the proposed additional Mobile Units to reach areas as yet untouched.

PUBLIC HEALTH LABORATORY SERVICES

Four small one-man laboratories are responsible for most of the public health laboratory service in the entire Territory.

The laboratories in Juneau, Ketchikan, Anchorage and aboard the M/S Hygiene are responsible for carrying out all routine and/or emergency serological and bacteriological procedures relative to disease control and environmental sanitation which may be required in their respective areas.

Decentralization of laboratory facilities is essential in Alaska because of the time lapse which may occur between the submission of specimens to the laboratory and the issuance of the report of findings. Specimens from towns not on regular air routes are frequently delayed two or more weeks in reaching the laboratory. Specimens and supplies which must be shipped long distances in winter are often frozen.

The laboratory services are used chiefly by practicing physicians, public health nurses, and other health personnel. In those communities without medical or public health personnel, local police and school officials may submit water samples and other materials for examination. Thus laboratory service is available to even the most isolated settlement but is often ignored through lack of an educational program.

A mobile field laboratory unit is maintained for emergency investigations in isolated areas. Activation of this unit requires the temporary assignment of regular personnel to the unit, with a resultant understaffing of one of the laboratories and subsequent stoppage of routine services in that laboratory.

The use of laboratory animals for diagnosis has not been instituted. The present procedure of sending specimens outside for testing involves considerable expense, inconvenience and delay.

Program Prior to July 1, 1948

The first public health laboratory in Alaska was established at Juneau in 1936. District laboratories were opened in Anchorage in 1940, Ketchikan in 1943, and aboard the M/S Hygiene in 1945.

In its 12 years of existence, the services performed by the Public Health Laboratory Division have almost tripled.



Health Department laboratories are located in Ketchikan, Juneau, Anchorage and aboard the M/S Hygiene.

Forty-seven different types of laboratory examinations and procedures are provided by the Alaska laboratories.

Program Since July 1, 1948

Plans for a fifth laboratory to be located at Fairbanks are being completed. The new laboratory will service the Upper Interior and Arctic regions.

Additional personnel are being recruited to staff the new laboratory.

A chemical laboratory, the first of its kind in Alaska, is being completed in Juneau. Chemical analyses of food, water and other materials will be conducted by this laboratory.

Future Plans and Suggestions for Further Development

Laboratory facilities and services will need to be expanded sufficiently to meet the needs of case-finding programs in tuberculosis and venereal disease, and the expansion of other Health Department program requiring laboratory services.

Through joint planning, the laboratories of the Alaska Department of Health will cooperate to the fullest possible extent in the investigative activities of the U. S. Public Health Service, designed to obtain baseline information concerning diseases of man prevalent in Alaska.

HEALTH EDUCATION

The wide scattering of population in Alaska has made difficult Territory-wide planning and administration of the health education program. The wide variation in local health problems, languages, educational levels, and customs in various parts of Alaska render material prepared for use in the States of limited value in Alaska. Original material adapted to specific racial groups and specific areas must be developed within the Territory.

Wide scattering of population, small health education staff and restricted travel have placed the largest share of responsibility for the health education program on the local public health nurses and other field personnel.

Program Prior to July 1, 1948

The health education program was not formalized until February 1946. Tuberculosis education was emphasized through:

The organization of local Health Councils in 12 communities.

The preparation and distribution of original materials on tuberculosis in Alaska—notably a series of 6 teaching guides on tuberculosis in Alaska for different grade levels.

Meetings, lectures, movies, newspaper and radio publicity preceding community X-ray surveys.

An in-service education program was conducted through periodic institutes, distribution of monthly newsletters, showing of films, and by a limited amount of field consultation with staff and other professional personnel in the Territory.

A considerable part of consultant service in health education has had to be carried on by correspondence with staff nurses and others in the field.

Circulation of films and slides throughout the Territory has been restricted because of the lack of projection equipment in many communities.

Program Since July 1, 1948

From March to July 1948, the Health Education Unit was without any professional staff. New staff members began arriving in July, and the major portion of the time has necessarily been spent in orientation of new personnel and planning the program.

In addition to the newly appointed Health Education Consultant, the staff of the Health Education Unit has been expanded to include the following personnel:

An Associate Health Education Consultant,

A Health Education Consultant (Schools), and

A Health Education Technician (a specialist in the preparation of visual materials).

The Associate Health Education Consultant is being assigned to the Branch Office at Anchorage in order to facilitate the coordination of health education activities in the Interior.

Closer coordination of school health activities throughout the Territory is anticipated with the appointment of the Health Education Consultant (Schools), who will work with the Alaska Department of Education and Alaska Native Service teachers.

Plans are being made for the development of visual materials and publications specifically designed for use in Alaska, and for the revision of existing materials for wider use.

The expanded staff will insure increased consultation service for public health nurses, teachers, community health councils and other groups throughout the Territory.

Future Plans and Suggestions for Further Development

Particular emphasis is being placed on the organization of and work with local health councils in order that community leaders may be encouraged to assume greater responsibility in carrying on community health education programs.

Extension of the in-service training programs for Health Department personnel and professional workers in other agencies in the Territory is contemplated.

Special attention will be given to the development of materials for use in an accident prevention program.

The role of health education in all departmental programs, including tuberculosis control, nutrition, sanitation and venereal disease control, must be clearly defined and responsibility assigned for program activities. (i.e., In a community nutrition program, the nutrition consultant should work closely with health education personnel in development of program and materials for a particular community.)

As personnel and funds become available, evaluation studies will be undertaken to determine methods and media of health education best suited to different racial groups in the Territory.

It is proposed that an investigation be made of the practical aspects and values of setting up a demonstration training program in one isolated Alaskan community as a preliminary experimental step toward the development of a program of intensive lay-leader training which will serve as a model for other communities. (See Local Health Organizations.)



Health exhibits are presented at local fairs and special events.

NUTRITION ACTIVITIES

No basic data are available concerning:

The nutritional status of various population groups in Alaska.

The dietary habits of the different racial groups.

The relative food values of locally grown fresh and preserved foods, imported fresh and preserved foods.

The relation of soil composition to food values of locally grown products.

Program Prior to July 1, 1948

Nutrition activities in Alaska were begun late in 1945, when the first nutritionist was appointed to the staff of the Alaska Department of Health. Since that time the single nutrition consultant has devoted her activities to:

Consultation in the field and by correspondence with public health nurses, teachers, and other personnel on the staff of the Health Department and other agencies in local communities.

Distribution of printed and visual materials for use in nutrition

SEAL MEAT SEAL OIL GOOD FOODS FOR GOOD HEALTH



SEAL CAMP

SEAL MEAT-A MUSCLE MAKING FOOD.
SEAL OIL-RICH IN VITAMINS: VITAMIN A
FOR HEALTHY SKIN, EYES, AND LUNGS; VITAMIN
D FOR MAKING STRONG BONES AND TEETH

PUT SEAL MEAT AND SEAL OIL IN
CLEAN POKES.

STORE SEAL POKES IN COLD PLACE TO KEEP
MEAT AND OIL FROM GETTING STRONG.

Food poster,
one of a series,
prepared for use in
Eskimo communities,
emphasizes the value
of native foods.
The illustration
was drawn
by
a native artist.

education, and the preparation and distribution of monthly newsletters containing latest information on nutrition.

Nutrition surveys on limited scale:

One 2½ months' survey of the nutritional status and dietary habits of the population in four Eskimo settlements along the Arctic Coast was conducted in 1947, under a special research grant from the U. S. Public Health Service and with the assistance of a medical nutritionist and a biochemist from the States. A second brief survey was carried on among the Indians in the villages of Southeastern Alaska.

Program Since July 1, 1948

Since July 1, 1948, the nutrition staff has been increased by the addition of a Dietary Consultant and an Associate Nutrition Consultant.

The Dietary Consultant has begun consultation service with hospitals, schools and other institutions in Southeastern Alaska, and will extend these services to all schools and institutions in the Territory.

Expansion of community nutrition programs is under way with the assignment of the Associate Consultant to work with communities in the Southeastern area. She will also assist in the development of the school lunch program.

A two-day nutrition institute for personnel of the Alaska Department of Health, Alaska Native Service, dietitians, home demonstration agents and other interested persons, was held in Juneau in October 1948 to discuss nutrition problems of the Territory. The discussion, led by Dr. Walter Wilkins, Director of Nutrition Investigations and Services for the Florida Department of Health, centered on the effect of soil nutrients on crops; diet and tuberculosis; diet and dental caries; and Alaskan food resources. The urgent need for basic information concerning nutrition in Alaska was clearly established during the Institute. Following the two-day meeting, discussions of nutrition problems were held with doctors and dentists in Juneau, Ketchikan, Anchorage and Fairbanks.

Limited experimental determinations of the Vitamin C content of certain locally grown foods have been attempted in cooperation with the Laboratory Division of the Health Department. With the completion of the new chemical laboratory at Juneau, further experimentation is anticipated.

Future Plans and Suggestions for Further Development

Assistance in developing programs of nutrition education is being extended to other areas of the Territory through increased consulta-

tion services to public health nurses, teachers, hospital staffs and community leaders.

Integration of nutrition education in the work of the community health councils is being emphasized, especially among Native groups, in order to promote the inclusion of native foods and locally grown products in the daily diet.

Greater emphasis will be placed on in-service training in nutrition for public health nurses of the Alaska Department of Health and the Alaska Native Service, and for teachers throughout the Territory, since it is impossible for the limited nutrition staff to provide direct service for the entire Territory. Such training should be carried on in cooperation with Extension Service personnel in the Territory.

DENTAL HEALTH

Better than 90% of the Alaskan Natives are badly in need of dental services.

There are 34 dentists in private practice in Alaska, 22 of whom are located in the four major population centers. The remaining 12 are scattered for the most part throughout the Southeastern and South Central areas. There is one dentist in the Arctic area, but none in the Aleutian Chain or Bristol Bay areas.

There are four public health dentists in the Territory.

Few of the people in isolated areas needing dental attention can afford to travel to the centers where dentists and dental facilities are located. One dentist and one Mobile Unit can cover relatively little territory during the short season when travel is possible.



Community
health councils
are active
in several
Alaskan
communities.

Dental
services
are
provided
aboard
M/S Hygiene.



Program Prior to July 1, 1948

Public health dentistry is a recent addition to the Alaska health program, the first public health dentist and a dental assistant having been added to the staff in 1947.

Dental personnel were stationed aboard the M/S Hygiene, and treated 3,750 people in 31 villages and towns along the coastal area. The major portion of time was devoted to emergency treatment, as this was the first time many of the people had had access to a dentist. Time did not permit restorative work.

From January to July, 1948, the dentist and dental assistant employed by the Health Department were located at Mt. Edgecumbe School and Hospitals, and Wrangell Institute. A total of 1,623 students and patients were examined and/or treated. Over 1,100 teeth were extracted, 378 fillings placed and 21 dentures constructed. As a result of this program, two complete units were established at the Mt. Edgecumbe Hospitals.

Program Since July 1, 1948

A second dentist and dental assistant have been appointed to carry on the dental services rendered aboard the M/S Hygiene.

A dental unit has been set up at Seward Sanatorium and emergency services are being provided for the 150 patients. Eventually these facil-

ties will be completed so that all types of dental service can be provided both for Sanatorium patients and the 150 children at the nearby Jesse Lee Home.

A second mobile dental unit is being set up to service villages along the highway and rail belt.

A third mobile unit is proposed which will be transported by air to inaccessible areas. Considerable difficulty is being experienced in locating light-weight portable equipment. The problem of finding dentists willing to come to the Territory is also causing delay.

Future Plans and Suggestions for Further Development

It is proposed that a dental fluoride program be incorporated into the generalized dental programs outlined above.

If feasible, a minimum of 9 itinerant dental units should be planned in order to provide dental care for urgent cases in isolated areas. The proposed coverage by additional units would be as follows:

A unit at Kotzebue or Nome to serve Seward Peninsula.

A unit at Bethel.

A unit at Seward to cover Kenai Peninsula.

A unit at Kanakanak Hospital.

A unit at Fairbanks to cover surrounding villages and Yukon River communities.

A unit at Haines or Skagway to cover highway areas to Anchorage.

An additional dentist is to be assigned to the dental unit at Mt. Edgecumbe Hospitals. It is felt that there should be one resident dentist at the hospital on a full-time basis, with a second dentist to serve as part of an itinerant unit for Wrangell Institute and Southeastern Alaska. The Mt. Edgecumbe unit will require services of two dentists during the school year, at least until the most serious needs are met.

The present emergency dental program and the proposed services, if they are to be of lasting benefit, must be backed up by a well integrated plan of dental education stressing oral hygiene, proper foods, and the value of preventive dentistry for children. It is proposed that such a program be planned and put into effect as soon as possible.

MENTAL HEALTH

There is no facility for care of the mentally ill in Alaska. Alaskan patients are hospitalized at Portland, Oregon, which is 1,200 miles from Juneau. Care of mental patients from Alaska at this facility costs approximately \$480,648 annually, excluding travel costs.

There is one psychiatrist in Alaska.

The exact number of persons in Alaska in need of hospitalization because of mental illness is unknown. There are 335 patients currently in the Portland Hospital. The average annual census of patients from Alaska is around 350.

The present procedure (Jury trial) used in committal is archaic and needlessly cruel.

Patients awaiting committal must be held in jail as there are no facilities for temporary care.

Program Prior to July 1, 1948

The main and practically only activity of the mental health program has been the training of the public health nursing staff members. Two have been sent Outside for special training in this field.

Mental hygiene institutes were held in Juneau and Anchorage in May 1948, for personnel of the Health Department and other agencies. A Mental Hygiene Consultant from the U. S. Public Health Service conducted the meetings.

Program Since July 1, 1948

Positions for a Psychiatric Social Consultant and a Clinical Psychologist are included in the 1949 budget.

The services of the only qualified psychiatrist in the Territory have been obtained on a part-time basis.

The training program for public health personnel is being continued.

Future Plans and Suggestions for Further Development

It is proposed that a 450 bed hospital for mental patients be constructed in Alaska. It is suggested that this institution be located in one of the medical centers in the Territory so that the services of specialists will be available. The hospital should be operated as a unit of a medical center if possible. The Anchorage area is suggested as a logical site for the institution for the following reasons:

General and other special facilities have been authorized for the area.

The Anchorage area contains the largest concentration of health personnel in the Territory.

Its central location and direct access to the Alaska Railroad, highways and major airports would facilitate transportation of patients.

Appropriate legislation will be needed in order to improve the present commitment procedures.

As soon as personnel become available, it is proposed that psychiatric clinics be established, one in Southeastern and one in Interior Alaska.

HOSPITAL SURVEY AND CONSTRUCTION

There are 23 general hospitals, 2 tuberculosis sanatoria, and one orthopedic hospital serving the civilian population of Alaska.

Of the 25 general hospitals, 9 were owned and operated by church organizations, 8 by Federal agencies, 4 by cities, and 2 by non-profit associations.

Table 2. Distribution of Hospital Facilities in Alaska by Type of Service, Ownership and Number of Beds; Existing and Authorized, January 1, 1949.

EXISTING

Location	Type of Service	Ownership	No. of Beds
Anchorage	General	Church	76
Bethel	General	Government (Fed.)	45
Cordova	General	Non-Profit Association	23
Fairbanks	General	Church	51
Ft. Yukon	General	Church	37
Juneau	General	Church	55
Juneau	General	Government (Fed.)	48
Kanakanak	General	Government (Fed.)	37
Ketchikan	General	Church	83
Kodiak	General	Church	19
Kotzebue	General	Government (Fed.)	21
Mt. Edgecumbe	Orthopedic	Government (Fed.)	65
Mt. Edgecumbe	Tuberculosis	Government (Fed.)	156
Nome	General	Church	34
Palmer ¹	General	Non-Profit Association	12
Petersburg	General	Government (City)	9
Point Barrow	General	Government (Fed.)	20
St. Paul Island	General	Government (Fed.)	10
Seldovia	General	Government (City)	8
Seward	General	Church	30
Seward	Tuberculosis	Church	130
Sitka	Chronic	Government (Terr.)	44
Skagway	General	Non-Profit Association	10
Tanana	General	Government (Fed.)	34
Valdez ²	General	Non-Profit Association	17
Wrangell	General	Church	13

¹Original Structure burned in 1946. Present facility is temporary.

²Original Structure burned in 1947. Present facility, temporary structure, closed 1948 because of lack of medical personnel.

AUTHORIZED OR UNDER CONSTRUCTION

Location	Type of Service	Ownership	No. of Beds
Anchorage	General & T.B.	Government (Fed.)	400 ³
Nome	General	Church	34 ⁴
Bethel	Tuberculosis	Government (Fed.)	20*
Kanakanak	Tuberculosis	Government (Fed.)	20*
Kotzebue	Tuberculosis	Government (Fed.)	20*
Mt. Edgecumbe	Tuberculosis	Government (Fed.)	200 [†]
Point Barrow	Tuberculosis	Government (Fed.)	20*

³100 general beds and 300 tuberculosis beds.

⁴Replacement of hospital which burned in 1948.

*Quonset hut additions to existing facilities.

[†]Addition to existing facility.

There are 736 general beds, 286 tuberculosis beds, 65 orthopedic and 50 chronic disease beds in Alaska.

Many of the existing hospital beds are housed in facilities which are public hazards and should be replaced. 78% of the beds in the 14 general hospitals operated by church and other non-governmental agencies have been declared non-acceptable according to the standards established under the Hospital Survey and Construction Program.



Surgeon demonstrates special equipment to staff at Mt. Edgecumbe Orthopedic Hospital.

According to the Alaska Hospital Plan, the need for additional hospital facilities and beds has been determined as follows:

Type of Facility	Number of Additional Facilities	Number of Additional Beds Needed
General Hospitals	16	489
Tuberculosis Hospitals	5	816
Mental Hospitals	1	438
Chronic Disease Hospitals	1 (possibly 2)	175
Total	23 (possibly 24)	1,918

The total needs as reflected in the Alaska Hospital Plan are limited by the maximum ratios set forth in the Hospital Survey and Construction Act. These ratios are unrealistic and misleading when applied to Alaska.

The present financing of existing hospitals is inadequate, with the result that services must be limited. Hospitals are reimbursed for most government beneficiaries at a rate of \$8 or less per day. It is estimated that the provision of minimal health services costs the hospitals approximately \$15 a patient day in Alaska.

There are no facilities in Alaska for care of mental patients or for isolation of communicable diseases.

The hospitalization of persons living in small communities involves miles of expensive time-consuming and often dangerous travel.

There are 15 health centers and two auxiliary facilities located in the Territory. The majority of these facilities are inadequate.

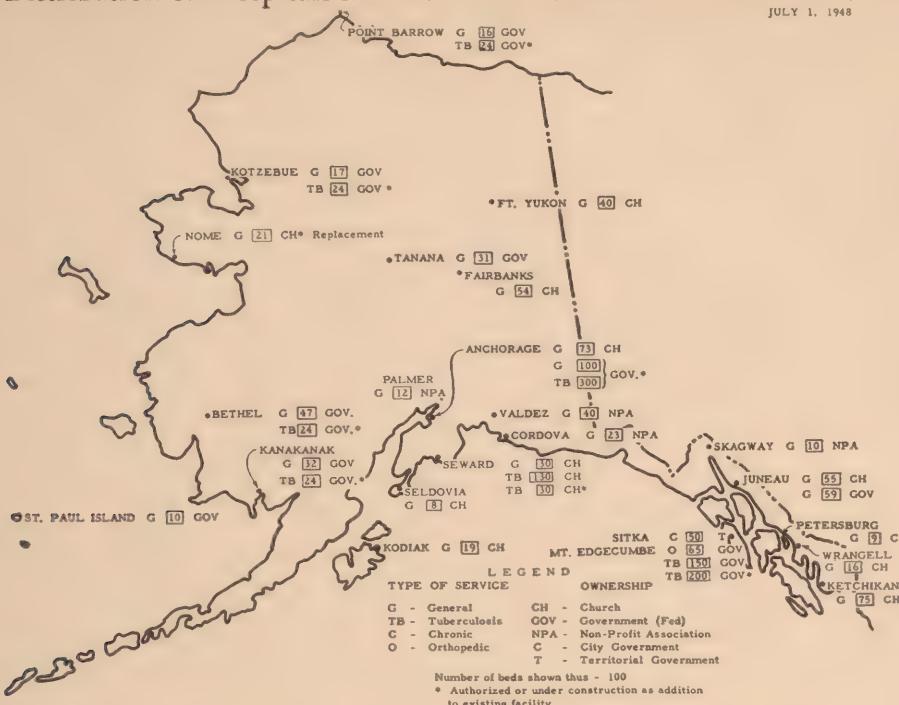
Future Plans and Suggestions for Further Development

It is proposed that the Alaska Hospital Plan be revised to reflect the total hospital and health center needs of the Territory without regard to the ratios as set forth in the Hospital Survey and Construction Act, which are not realistically applicable to the Alaskan situation. Careful consideration must be given in the plans to the need for hospital facilities for Federal beneficiaries.

It is suggested that tuberculosis, mental, and chronic disease facilities planned for Alaska be constructed in medical centers, as units of or adjacent to general hospitals.

A minimum of 1,000 beds for tuberculosis hospitalization has been established as an immediate goal. Consideration must also be given to replacing existing non-acceptable beds, and proposed facilities should be so located that the beds can be converted from tuberculosis to general service at a later date as the tuberculosis death rate is reduced.

Distribution of Hospitals BY LOCATION, TYPE OF SERVICE, OWNERSHIP AND NUMBER OF BEDS: ALASKA, JULY 1, 1948



The construction of a mental hospital of 450 beds has been proposed for the Anchorage area. It is also proposed that mental units be established in general hospitals throughout the Territory to provide local treatment of acute cases and to provide more humane care of patients awaiting commitment to a mental hospital.

It has also been proposed that administration of all government hospitals in the Territory be concentrated insofar as practicable in a single medically directed agency, with other governmental agencies contracting for needed service; that all persons in the Territory be eligible for admission; and that medical staffs be open to private physicians.

It is suggested that governmental agencies establish a per diem rate for hospitalization sufficient to cover the costs of adequate service.

The provision of adequate health centers is being included as a part of the proposed community facilities program.

CANCER CONTROL

There has been no organized cancer control program in Alaska.

There are no reliable recent figures concerning either the incidence or the number of deaths caused by cancer in Alaska. According to a

recent report¹, 81 deaths, or 7% of all deaths in the Territory in 1945 were caused by cancer, as compared to 13% for the United States as a whole.

Program Prior to July 1, 1948

Cancer control activities have included:

Establishment of funds for training a limited number of physicians each year at institutions in the States in the principles and latest techniques of cancer detection and control. Three physicians received training in 1947; two in 1948.

Distribution of pamphlets, posters and other educational materials through health centers and staff personnel.

Program Since July 1, 1948

The above activities are being continued and intensified.

The Alaska Chapter of the American Cancer Society has been organized with headquarters in Juneau. This organization will serve as a means of broadening existing programs of education for both professional and lay groups.

Future Plans and Suggestions for Further Development

It is proposed that a pathological laboratory for diagnosis and study of cancer tissue be established in Alaska.

The present program of training for individual physicians will be continued and expanded as the need and circumstances indicate.

Greater emphasis will be placed on cancer education for the general public.

¹**Cancer Statistics.** The American Cancer Society, 1948.

Part II

The Program of the U. S. Public Health Service in Alaska

ORGANIZATION AND PURPOSE

The activities of the U. S. Public Health Service in Alaska are under the general direction of a Field Station which was established in Anchorage, Alaska in July, 1948. As the official representative of the U. S. Public Health Service in the Territory, the Field Office is specifically responsible for the overall planning, direction and coordination of the program made possible by a special Congressional appropriation, for fiscal 1949, totaling \$1,115,000.

Under this appropriation, entitled "Disease and Sanitation Investigations and Control, Territory of Alaska," the activities of the Field Station are divided into two phases:

1. The cooperative activities carried on through joint planning with the Alaska Department of Health.
 - a. Special grant-in-aid funds are included in the above appropriation for assisting the Alaska Department of Health in carrying out its program of health services by furnishing supplemental funds.
 - b. Additional funds are included in the appropriation for the assignment of Public Health Service personnel to the Alaska Department of Health on a "lend-lease" basis. Such personnel as are assigned in this manner are under the direction of the Health Department.

The cooperative programs maintained by the Alaska Department of Health with the assistance of the U. S. Public Health Service are described in detail in Part I of this report.

2. The second and major function of the U. S. Public Health Service Field Station in Alaska is the establishment of a basic program of investigation in those fields of health, sanitation and disease control which offer special difficulties in the development of Arctic areas.

The immediate intent of the proposed program of investigation is to assemble usable information concerning the numerous problems relating to Arctic health, and to initiate, as rapidly as possible, field and laboratory research activities in each of the proposed fields.

Plans have been made to launch preliminary investigations in six major fields. The list of proposed fields, which is tentative and by no means complete, includes:

1. **Environmental Sanitation**—Particularly problems of safe water supplies, adequate waste disposal facilities and suitable housing in permafrost areas.
2. **Entomology**—Study of problems concerning the nutritional status

and needs of Native and other groups, and the production and preservation of foods under conditions peculiar to Arctic regions.

4. **Animal-borne Diseases**—Research in veterinary pathology and the possible transmission of disease from animals to man in an Arctic environment.
5. **Epidemiology, Bacteriology and Parasitology**—Study of the influence of Arctic conditions on the reactions and characteristic behavior of causal organisms of disease.
6. **Physiology**—Study of the reaction and adaptation of the human body to conditions peculiar to life in the Arctic.

A more detailed listing of the proposed research studies in each field is included in the following pages.

Progress Since July 1, 1948

Since adequate physical facilities for laboratory research are not now available in Alaska, a considerable portion of the initial activities of the Field Station is being devoted to securing and equipping the necessary facilities. Insofar as possible, existing facilities, such as Health Department and Army laboratories, will be used in order to launch the program as rapidly as possible.

Key personnel, particularly program directors, have been selected for a number of the research projects. Personnel already appointed have begun work in developing their respective programs. Each program director has completed or is in the process of carrying out the following preliminary steps:

1. A review of previous work in the specific field of investigation through library research;
2. An initial visit to Alaska to become acquainted first hand with the actual situation and the existing problems in each field; (each director will also need to ascertain the availability of laboratory and other facilities suitable for the needs of his program);
3. The formulation of a detailed program of study;
4. Return to the States to recruit staff workers and to order special supplies and equipment;
5. Return trip to Alaska to set up the program and to launch operations.

AREAS OF INVESTIGATION AND PROPOSED STUDIES

The following outline covers the types of problems which exist in each of the selected fields of investigation; some of the specific studies which have been recommended; and the progress which has been made toward establishing the research programs:

ENVIRONMENTAL SANITATION

Existing sanitary facilities in the Arctic and sub-Arctic areas are not suited to the environment. There are no complete water or sewage treatment plants in these areas.

Very little information is available on design, construction and operation of community water purification plants, sewage treatment plants, distribution systems, and single dwelling sanitary facilities under prolonged low temperature conditions.

In addition to protection against freezing, there are many difficulties associated with chemical and biological treatment processes when water is practically at the freezing point.

Solutions for these and other problems relating to the ill effects associated with a faulty environment in the cold climate are urgently needed.

Recommended Studies

1. Water Supplies.

Studies of the design, construction, and operation of wells, water purification plants, and distribution systems for use under low-temperature conditions, particularly in permafrost areas.

Studies of surface waters, which should include the biological, physical, and chemical characteristics of such water. A special study is suggested to determine whether deleterious substances are present in the concentrates which result from the freezing processes and remain in the water of lakes under the thick ice coverage that occurs in Arctic regions. Another special study is suggested to determine any characteristics of surface water that might be involved in outbreaks of intestinal disturbances.

Water pollution studies of inland and coastal waters to obtain basic information for water pollution control. These observations should be coordinated with the overall studies on the characteristics of surface waters.

Studies of ground waters, which should include their biological, physical, and chemical characteristics. A special study should be made on the movement of underground waters in permafrost areas, particularly in areas where summer thawing extends some distance below the ground surface.

2. Sewage and Waste Disposal.

Studies of the design, construction, and operation of sewerage systems, including collecting systems, treatment plants, and outfall sewers for use under low-temperature conditions, particularly in permafrost areas. These studies should include systems for communities, institutions of all kinds, and for isolated dwellings.

Studies of methods other than water carriage systems of sewage and excreta disposal for use under low-temperature conditions. This study should naturally include such methods as the chemical toilet and the pit privy. In addition to the design, construction, and operation of such installations, their practicability for actual use under low-temperature conditions should be considered.

Studies of waste disposal in fish canning operations, including plant investigations to determine:

Methods of reducing the quantity of waste.

Methods of utilizing by-products in manufacture.

Methods of treatment and disposal of unusable material.

3. Housing.

Studies of economical designs and construction materials, especially for dwellings and housing units, including native housing. In this connection the possibilities of developing and using native or local materials should be considered.

Studies of permafrost problems in relation to the construction of housing.

Studies of community planning in order to insure adequate and safe sanitary facilities such as water supply and sewerage systems, garbage and waste disposal.

4. Food Handling.

Studies of native food handling customs and practices in Alaska and their relation to disease. An attempt should be made to develop, as far as possible, remedial practices that may gain acceptance by the Natives. This study might well be correlated with an investigation on the nutritional aspects of food.

5. Shellfish Poisoning.

Further studies of shellfish poisoning, including its public health implications and methods of control that may be applied to the production, processing, handling, and distribution of such products.

6. Garbage Disposal.

Studies should be made of the practicability of using the "sanitary fill" method of garbage and waste disposal in low-temperature areas. Special consideration should be given to the rate of disintegration and decomposition of organic materials under such conditions, and also to the feasibility of stockpiling garbage during low-temperature periods.

Present Program—Fiscal Year 1949

A two months preliminary survey of sanitation and engineering prob-

lems in the Arctic was conducted in July and August by Professor H. A. Whittaker, Special Consultant to the Public Health Service.

The initial activities of the director of the studies in environmental sanitation relate to the collection of data concerning the operation of sanitary facilities in the Arctic based on the actual experiences, over a period of years, of the following agencies:

Alaska Department of Health
Army Engineering Corps
Alaska Native Service
Civil Aeronautics Administration
University of Alaska
U. S. Coast and Geodetic Survey
Fish and Wildlife Service

If the information regarding single dwelling and small community sanitation obtained from these sources warrants, a preliminary report will be compiled for use as a guide by the Health Department and other interested groups.

Arrangements for long term studies on the design, construction and operation of water and sewage systems in low temperature areas are being made. These studies will include systems designed for communities, institutions, and for single dwellings. The proposed studies are being coordinated with the permafrost studies of the Army Engineering Corps.

The second major area of investigation in which plans are being developed, relates to studies of the biological, physical and chemical characteristics of surface and ground waters, and of sewage which has been subjected to various types of treatment. Funds for the establishment of the necessary laboratory facilities will probably not be available during the current fiscal year. However, the necessary preliminary steps will be completed in order that actual laboratory work may begin with the advent of cold weather in the fall of 1949.

ENTOMOLOGY

The known incidence of mosquitoes and other biting insects in Alaska is recognized as a serious obstacle in the settlement of the Territory.

Insect-borne diseases are not known to be extensive, but the severe incidence of biting insects has constituted a major problem in military and civilian construction and in the daily life of inhabitants in areas with high mosquito population.

The mosquito population of a considerable portion of Alaska is more abundant than in any save the very worst areas of the United States.

The area of greatest abundance extends in the tundra country from Nome eastward across the Interior of Alaska and southward down the Alaskan Panhandle.

The use of insecticides is complicated by the constant renewal of breeding pools through seepage, thawing and poor drainage in permafrost areas.

The Army has demonstrated that relatively effective mosquito control can be obtained by the use of repeated airplane dusting. However, due to the long flight range of the species of mosquitoes prevalent in the Arctic, it is necessary to dust an area repeatedly, covering several miles in every direction from the population center in order to obtain control. This method is economically feasible only where there are large concentrations of people. Other control methods normally utilized in tropical and temperate climates are considered ineffective.

In addition to a large mosquito population, 19 different species of blackflies, 8 of punkies and a number of deerflies are known to exist in Alaska.

Recommended Studies

A working collection of Alaskan species of biting and household insects should be acquired.

First hand information concerning Arctic arthropods should be acquired through field observations, including landing counts, larval surveys, determination of breeding places and other factors.

Special studies of the detailed life histories of important species should be undertaken, including their biology, morphology, hibernation habits, longevity, and host preferences.

Limnological studies of breeding areas of Alaskan mosquitoes, including the physical and chemical characteristics of water and the growth of plant life and food substances in breeding areas, should be instigated.

Studies should be undertaken to determine the vectors and other facts concerning the transmission of endemic arthropod-borne diseases.

Technical, developmental studies should be undertaken for the purpose of devising and testing control methods economically feasible for use with small communities, governmental stations, and small groups of outside workers.

Present Program—Fiscal Year 1949

A staff of three entomologists has been selected. A preliminary visit to Alaska has been made by the Director of the Program, and necessary steps are being taken to begin active field operations with the advent of warm weather in the spring. Arrangements are being made to secure laboratory space from the Army at Fort Richardson.

Activities to be undertaken during the calendar year 1949 include:
Studies relating to the life histories of important species of mosquitoes.

Field trials of various control measures for small settlements. This will include the development of apparatus, and observation of the effectiveness of proposed methods of insect control.

NUTRITION

Very little basic data is available regarding nutrition in Arctic areas.

Recommended Studies

- Studies of the nutritional status of the population in cold climates.
- Analytical studies of foods available in Arctic areas.
- Determination of the effects of prolonged cold on the quantities of fat, protein and carbohydrate needed in the diet.
- Determination of the role of the specific dynamic action of food in heat conservation of the body.
- Study of the relationship between effects of solar radiation on skin and eyes (e.g., snow blindness) and vitamin requirements and metabolism.
- Studies of the relation of soil composition to the food value of native grown foods.
- Studies of the significance of nutritional factors in disease unique to cold environment (e.g., frost bite).
- Studies relating to food technology in general, including food preparation and effects of long periods of storage on nutritive value of available foods.
- Determination of fluorine content of local water supplies.
- Detailed study of food habits of Native groups in relation to their nutritional status.

Present Program—Fiscal Year 1949

The director of the biochemical phase of the nutrition research program has been employed and is in the process of developing a detailed program. Negotiations are under way to secure the services of a physician who will assume charge of the medical aspects of the program.

Laboratory facilities for biochemical analyses are being developed.

Activities planned in fiscal 1949 include studies of the:

- Nutritional status of the population of Arctic and sub-Arctic areas.
- Nutritive qualities of native foods through biochemical analyses.

ANIMAL-BORNE DISEASES

Although the animal population is large, little is known regarding animal reservoirs of disease in the Arctic. Certain animal species live in close association with man (dogs, reindeer, and other domesticated animals), while others constitute a substantial item in man's diet (fish, reindeer, moose, seal, walrus, bear, swine and cattle).

Animals suspected of harboring diseases which may be transmitted to man include rodents, birds, fish, cattle, walrus, swine, reindeer, moose and various carnivores, particularly dogs, wolves, bears and foxes.

There are many diseases common to man and lower animals in Arctic areas, about which little is known. Studies of these diseases should include:

Brucellosis.

Enteric diseases including *Salmonella* infections.

Leptospirosis.

Neurotropic virus diseases including rabies and the various types of encephalitis.

Parasitic diseases including trichinosis, echinococcosis and *Diphyllobothrium latum* infections.

Rickettsial diseases including murine typhus and "Q" fever.

Tuberculosis.

Tularemia.

Virus pneumonias.

Recommended Studies

It is recommended that long-range studies be carried out on animals suspected of serving as reservoirs of the above diseases in order to:

Obtain detailed information concerning the extent of endemic or epidemic areas of these diseases.

Discover the modes of transmission of these diseases from animals to man.

Determine effective methods of control.

Examples of the types of studies recommended include:

Determination of the extent of *Salmonella* infections in animals by bacteriological examination of animal excreta and food products of animal origin.

Determination of the incidence of brucellosis in animals by agglutination tests on animal specimens and by bacteriological examination of food products of animal origin.

Determination of the extent of the trichinosis problem by gross and microscopic examination of animal tissues (particularly bear, swine and rat).

Present Program—Fiscal Year 1949

A preliminary survey was conducted in Alaska in July and August under the direction of the Chief of the Veterinary Public Health Section of the Public Health Service.

A research staff including a veterinary pathologist, a veterinary parasitologist and a bacteriologist has been employed.

The Aero-Medical Laboratory at Ladd Field near Fairbanks has offered its facilities for the use of the Veterinary pathologist.

A bacteriological-parasitological laboratory is being established by the Public Health Service in Anchorage. Space for the laboratory has been acquired. The delivery of equipment and supplies has been delayed by the West Coast shipping strike.

Arrangements have been made to have the serological study of specimens made at the Communicable Disease Center in Atlanta.

Arrangements have been made with the Army for the trapping of wild animals in the Fairbanks area, with the Navy for the trapping of rats in the Aleutian area, and with Territorial veterinarians for obtaining dogs for examination.

During the initial phases of the program, considerable attention will be given to the possible role of dogs in the transmission of tuberculosis in Alaska. Alaska has a very high incidence of tuberculosis of the bone and skin and the possibility that dogs are involved in its transmission has been suggested by various observers.

Attention will also be directed toward determining possible reservoirs of disease among wild rodents, since they are known to transmit many diseases to man in other parts of the world.

EPIDEMIOLOGY, BACTERIOLOGY AND PARASITOLOGY

Epidemiology in Arctic regions is largely a closed book, although it is known that the epidemiological pattern of certain communicable diseases varies considerably from that of the same disease in other climates.

Knowledge of the prevalence and distribution of bacterial, parasitic, virus and rickettsial diseases as well as special factors affecting their transmission in Arctic areas must be ascertained if effective control measures are to be developed.

Outbreaks of illness associated with gastro-intestinal disturbances are extremely common in the Arctic. The causes of the outbreaks are usually unknown, although there has been laboratory confirmation of the diagnosis in several instances, including:

Ten epidemics of typhoid fever;

One epidemic traced to **Salmonella montevideo**, one traced to **Salmonella typhimurium**, and one traced to **Salmonella choleraesuis**;
Two epidemics caused by **Shigella paradysenteric** (Flexner);
Seven outbreaks of food poisoning caused by staphylococci.

Parasitic infections are known to be prevalent. Amoebiasis, echinococcus infection, and trichinosis have been reported, and routine laboratory examinations have disclosed the presence of **Diphyllobothrium latum** (fish tape-worm) and **Necator americanus** (hookworm).

Low temperatures are known to extend the viability of infective agents.

Recommended Studies

Intensive field investigations of epidemics should be made in order to determine the fundamental epidemiological characteristics and patterns of disease under Arctic conditions.

Laboratory investigations should be carried out in order to obtain precise information concerning the agents involved and the methods of transmission of disease in cold climates. Fixed laboratory facilities will be required for the study of parasitic, virus, rickettsial infections and diseases of bacterial origin, as well as mobile units for the investigation of epidemics in the field.

Present Program—Fiscal Year 1949

The services of the Director of the Anchorage District Laboratory of the Alaska Department of Health have been made available to the Public Health Service to initiate studies of intestinal diseases. These studies will be to determine the types of enteric bacteria present in Alaska, and the extent of infection with human intestinal parasites. The director will be responsible for the bacteriological and parasitological examination of fecal specimens collected during the summer months and during the outbreaks of gastro-enteritis which invariably follow the spring break-up.

A cooperative program has been developed with the Alaska Department of Health and the Tuberculosis Evaluation Laboratory in Atlanta for special bacteriological studies leading to the determination of types, strains, variations, and mutations of the tubercle bacillus found in Alaska.

Preliminary arrangements are being made to initiate studies, correlated with the veterinary public health investigations, to determine the incidence of murine typhus in Alaska. The plans include:

Serological study of blood specimens from rats;

Entomological study of ectoparasites found on rats. Arrangements

have been made with the Navy for the trapping of rats for these studies.

Routine study of serological specimens submitted by physicians from cases of "fevers of undetermined origin."

PHYSIOLOGY

Fundamental physiological studies of man's acclimatization to life in the Arctic with its characteristic low temperatures, abnormal daily and seasonal sunlight and other climatic factors, are of primary importance to the applied sciences in the public health field.

Opportunities for research have been so limited in the past that only isolated phenomena have been attacked, usually under artificial conditions which are not representative of the interrelation of climatic factors as they actually occur in Arctic regions.

Long-range studies in this field have not been feasible, chiefly because of the lack of permanent research facilities in Arctic areas.

Recommended Studies

Studies of Arctic animals should be undertaken to determine factors influencing their adaptation to cold. Research should include studies of their skin-fat barriers, circulatory adjustments, vitamin requirements, metabolism and endocrine systems.

Long-range studies of metabolism should be undertaken in cooperation with the recommended studies in nutrition, including special investigations of calorie, vitamin, water and salt metabolism under Arctic conditions.

Functional studies relating to the maintenance of body temperature by adjustments in the periphero-vascular system and metabolism should be initiated. Studies relating to the adaptability of these mechanisms in man should be useful in general health regulation and in the selection of individuals for duties in the Arctic.

Studies should be made of the respiratory response to cold (including the behavior of the mucosal surfaces of the respiratory tract) and the relation of these responses to resistance to infection. This is particularly important in view of the extremely high attack rate of communicable diseases in Arctic areas.

Studies relating to normal variation and racial differences in insensible water loss from the skin under Arctic conditions should be undertaken.

Special studies should be made of the psychological effects of prolonged cold and other environmental factors on the human being in relation to efficiency and emotional adjustments.

Present Program—Fiscal Year 1949

It is not anticipated that funds will be available to initiate studies in this field during the current fiscal year.

LIBRARY

At the present time there are no satisfactory library facilities in Alaska for use by persons engaged in research in the medical and biological sciences.

Adequate library facilities are an indispensable concomitant to effective research work, and must be readily accessible to research workers in the field.

Published reports of various expeditions and research activities in the cold climates are scattered in the literature and in various libraries throughout the world. No comprehensive collection of these reports is available at any central point.

Recommendation

It is recommended that a library, with research facilities, be established in Alaska, and that its resources be made available to all government, as well as non-government groups, working in the field of Arctic health or in the biological sciences.

Present Program—Fiscal Year 1949

Plans have been made to employ a research librarian who will assist investigative personnel in their library research, and who will be responsible for the initial development of a library.

Distribution of Public Health Facilities in Alaska

JULY 1, 1948

Library
National Institutes of Health
Bethesda 14, Maryland

